January, 1958 Vol. 47 No. 1

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine

Season's Greetings

It reaches far into the future

The Lake Pontchartrain Causeway is essentially a very long concrete bridge. Unlike other bridges, however, the concrete was *not* poured on location. It might almost be said this new monster was built on dry land and then erected where it was wanted. Thousands of precast prestressed concrete spans were assembled in just that manner. This new technique not only avoided the many difficulties and hazards inescapable with former construction methods, but it resulted in an economy in construction time and costs which will reach far into the future. Countless weeks of time and millions of dollars will thus be saved in building thousands of future highway bridges.

This story is typical of the American engineer and the products of his creative genius. But where does this genius come from? History shows us it is *not* hereditary. Distinguished engineers both past and present in most cases came from average homes. As youths they didn't act or react any differently than the lads who crowd our classrooms today. This creative genius, the spark of achievement, slumbers in every lad. Whether this spark is fanned into a flame before it is smothered decides the student's future. Time and time again, instructors of mechanical drawing have witnessed the awakening of this inner genius. Here the student discards his boyish fancies for the practical and achievable. For the first time he learns the meaning of precision craftsmanship. He begins to think analytically and to use sound judgment. During these formative days, impressions are indelible . . . good and bad. For this reason the student's drawing instruments should be selected with exacting care. Drawing instruments are basic tools of every engineer, and inferior tools will never inspire skilled workmanship. Drawing instruments are a lifetime possession, and the only instruments worthy of consideration are the very best the student can afford. Precision inspires precision...perfection inspires perfection.

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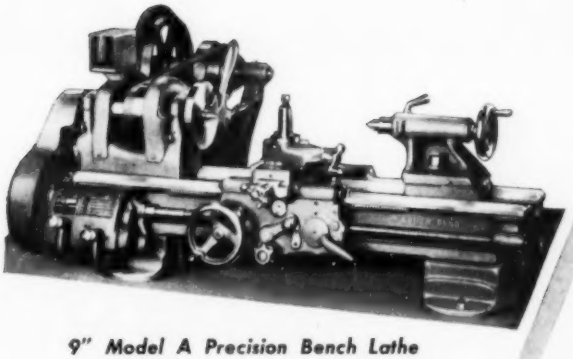


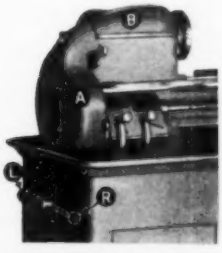
9" Model A Precision Bench Lathe

—12-speed drive, less electrical equipment, f.o.b. factory—$466. Other 9" Lathes from $280.

10-K Model A Precision Floor Lathe

—metal column base, underneath motor drive, less electrical equipment, f.o.b. factory—$897. Other 10-K Lathes from $388.

SOUTH BEND LATHES



Exclusive Safety Feature

Only South Bend 9" and 10-K Lathes with Underneath Motor Drive have this patented automatic safety interlock which prevents opening of gear gard "A" or headstock cover "B" unless belt tension lever "L" is moved to position "R" which disengages the motor drive.

The simplicity of South Bend 9" and 10-K Lathes has made them popular with both students and instructors. It opens the way to quick development of handling skill which means less work spoilage and student supervision.

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Mail the coupon for complete information on how you get more for your money in South Bend Machine Tools—in every way.

SOUTH BEND LATHE, SOUTH BEND 22, IND.

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NO. 132
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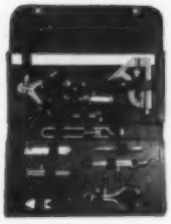
A moderately priced precision level with main vial and double plumbs. 4", 6", 9", 12" and larger sizes. Black wrinkle finish with machined bearing surfaces. Base grooved for use on cylindrical work.

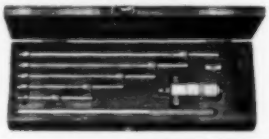
NO. 902 SERIES
SET OF TOOLS



No. 902A has 9" combination square; No. 902B a 12" square. Both have 1" micrometer, center gage, center punch, 6" rule, 4" inside and outside calipers, dividers and hermaphrodite calipers. Other sets available.

NO. 124A
INSIDE MICROMETER

Capacity 2–8 inches. Set includes Satin Chrome micrometer head with ½ inch movement, measuring rods, spacing gage and spanner wrench. Auxiliary handle also available. Larger ranges available.



NO. 596
PENCIL DIVIDER

Bow-type side adjusting divider with twin chucks that hold steel points or pencil leads. Excellent for drawing or layout work. Capacity, fully open, approx. 3¼ inches.

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POCKET SCRIBER

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JANUARY
1958

VOL. 47 NO. 1

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

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★ ★ ★

This Month's Cover

In this picture, sent to us by Harry A. Goldstein, APSA, graphic arts teacher at the Tucson High School, Tucson, Ariz., Ronald White is shown at work in the welding department. The teacher of welding is B. E. Douglass.

The photograph is by Junious Peters, photo student.

★ ★ ★

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JANUARY 2 TO 31

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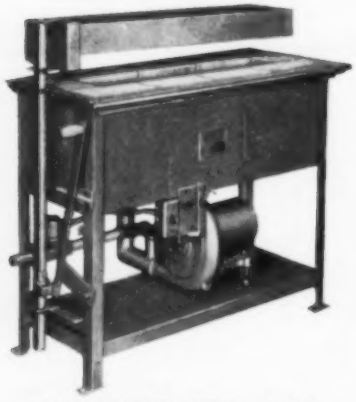
PRACTICAL TEACHING AID



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Personal News

DEGREE CONFERRED ON J. ASBURY SMITH

The doctor of education degree was conferred on J. Asbury Smith by Wayne State University, Detroit, Mich., on June 13, 1957. He received his B.S. degree at Central State College, Edmond, Okla., in 1940, and his M.S. degree from Oklahoma State University in 1942.

Dr. J. Asbury Smith

His dissertation, "Implications of Television for Industrial Arts," was concerned principally with the compilation of a brochure of production practices and techniques for telecasting industrial arts activities. Concomitant objectives were: (1) to identify significant practices for the brochure; (2) to report the scope of participation in telecasting industrial arts activities indicated by respondents in the study; and (3) to review the educational television movement as revealed by pertinent literature.

The brochure, "Practices and Techniques for Telecasting Industrial Arts Activities," has been published and is listed in the H. W. Wilson Vertical File Index. It may be obtained free upon request to the Office of Public Information, Central State College, Edmond, Okla.

Dr. Smith is professor and chairman of industrial arts at Central State College, Edmond, Okla., a position which he has held since 1942. Prior to this assignment, he taught and was principal of the elementary school at Hennessey, Okla. He taught industrial-arts classes at Webb City, Okla., and for a brief period was metalworking teacher at Taft Junior High School in Oklahoma City.

He is a member, and past president, of the Oklahoma Industrial Arts Association; the Oklahoma Council on Industrial Arts Teacher Education, having served for several years as its secretary; and the Oklahoma Education Association.

Membership in national professional organizations includes: National Education Association, American Industrial Arts Association, American Council on Industrial Arts Teacher Education, American Vocational Association, and National Association of Industrial Teacher Educators. He is also a member of the Industrial Arts Conference of the Mississippi Valley, and holds membership in Epsilon Pi Tau, Phi Delta Kappa, and Iota Lambda Sigma.

(Continued on page 14A)

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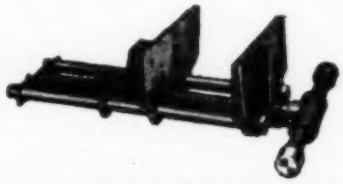
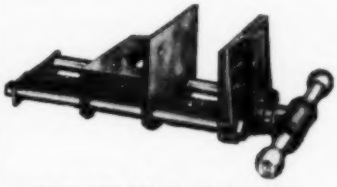
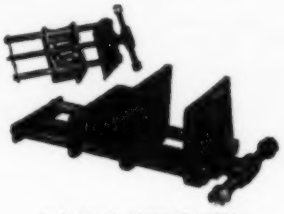


QUICK ACTION VISE



SOLID NUT CONTINUOUS SCREW VISE



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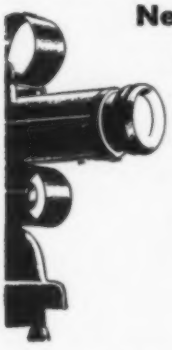

Another new visual aid series. This set covers boring tools such as hand drills, bit braces, bits, other tools and how to sharpen and use them.

Nine strips of 35mm. safety film in individual cans (151 frames in all) come packed in a storage box with a manual of suggested questions for testing.

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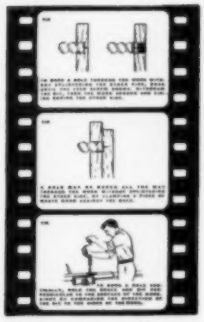
23	Types of Boring Tools	15	How To Use Hand and Breast Drills
11	Holding and Boring Tools and Accessories	16	How To Use Automatic Push Drills and Spiral Ratchet Screw Driver To Bore Holes
23	How To Bore A Hole	15	Boring Tools For Use in Electric Drills
15	How To Use The Doweling Jig	12	How To Sharpen Boring Tools
21	How To Use Expansive Bits, Forstner Bits, Brad Awls		



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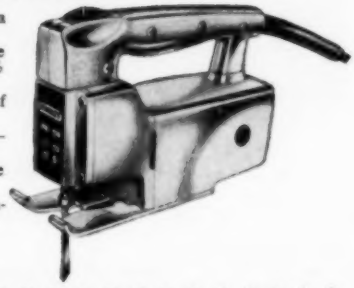
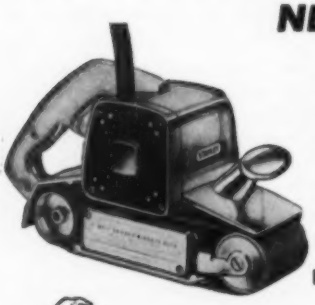


NEW! HEAVY DUTY SANDERS



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H31 Belt Sander

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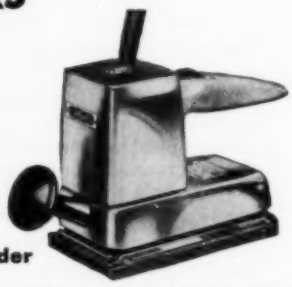

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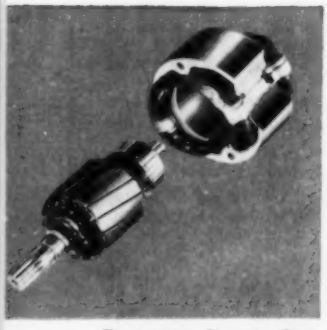

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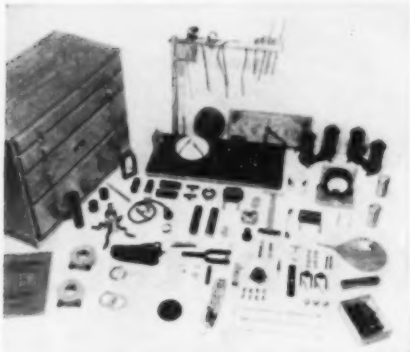

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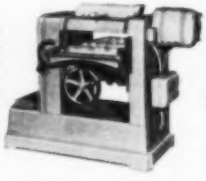

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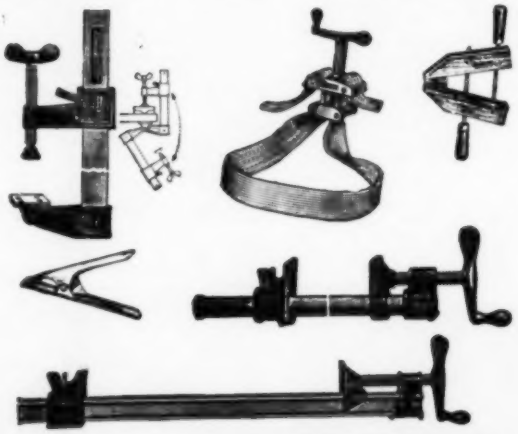

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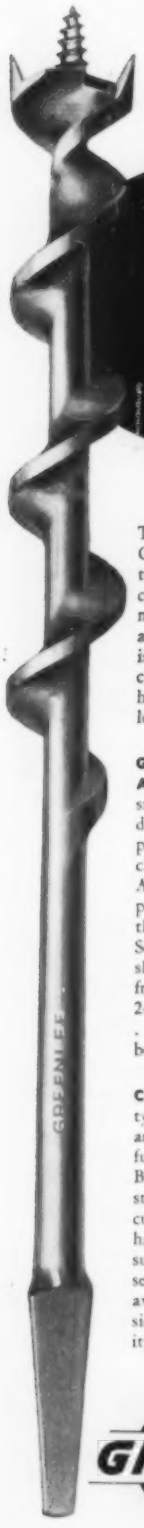

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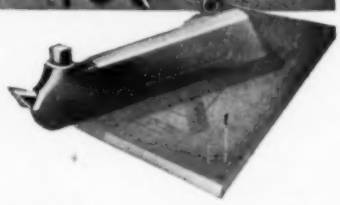

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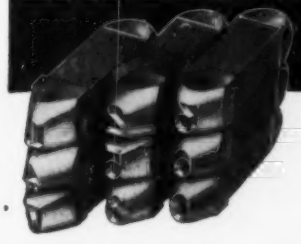

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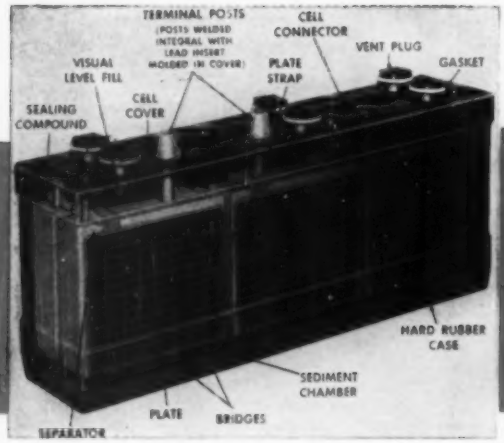

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Industrial Arts and Vocational Education
The Shop Teachers' Professional Magazine
JANUARY 1958

Exhibits Sell Shop Programs

RALPH ROGERS
Supervisor of Trade and Industrial Education
Division of Instructional Services
and
J. LYMAN GOLDSMITH
Supervisor, Agricultural-Vocational-Industrial Arts Division of Instructional Services
Los Angeles City Board of Education
Los Angeles, Calif.

Shop project exhibits are still one of the best ways of *selling the public* and interpreting the industrial education programs to the school-community. Project exhibits of a single school shop, a school shop department, or all the school shops in a school district serve school-community relations by:

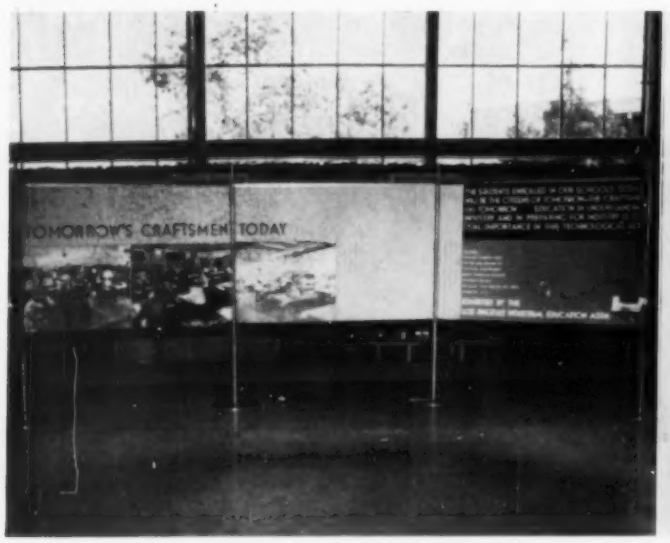
1. Stimulating public interests in the industrial education program.
2. Interpreting the industrial education program to the public.
3. Recognizing the achievement and craftsmanship of students.
4. Recognizing the service and inspiration of industrial education teachers.
5. Keeping the public informed of the work done in the industrial education program.

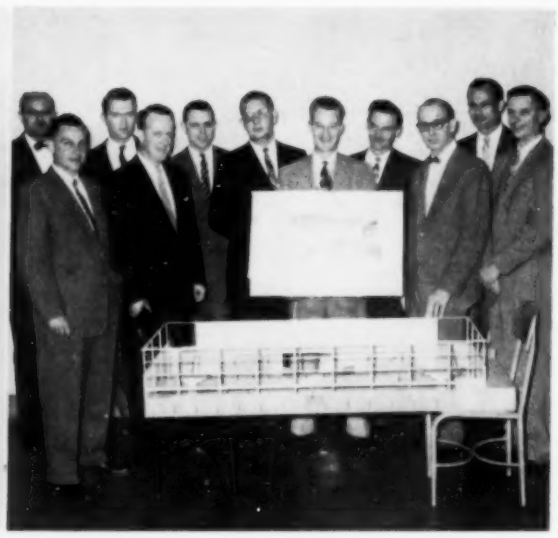
School shop project exhibits should be designed to serve specific purposes and appeal to the general public as well as the parents of students. This type of exhibit, whether presented in the school itself, a department store window, a public building, an airport terminal, a bank or a private hall, must be well planned and artistically presented.

So, you want to present a school shop project exhibit?

1. Be sure that you keep the exhibit simple, basic, and direct. Do not try to show too much.
2. Use the advice and assistance of as many people as you can.

Over-all view of the exhibit hall and individual booths. (At right) Teacher-student demonstrations illustrate phases of industrial education program





Central panel illustrates theme of the project show.(At right) Schoolmen and commercial patrons examine scale model of exhibit hall and accessories

3. Display student projects and photographs showing student work. Use showmanship.

4. Provide *handout* material explaining the exhibit. Assign teachers and students to personally answer questions.

Any school exhibit, from the single shop display to the ambitious school district-wide affair, will require that you organize for action, accept or assign responsibility, present and *sell* industrial education, evaluate the results of your efforts, and establish plans for future exhibits.

Organize for Action

1. *Establish a Steering Committee*
   - *a*) Formulate exhibit objectives. Decide what *publics* are to be reached.
   - *b*) Develop exhibit policies and procedures.
   - *c*) Determine exhibit theme. Build a short and catchy message that will convey the theme of the exhibit.
   - *d*) Set up a framework of organization.
   - *e*) Plan activities on a calendar basis. There is no substitute for early and careful planning. Successful exhibits require from six months to a year of advance planning.
   - *f*) Use many people in your planning — the art teacher for ideas on layout and posters, the journalism teacher for assistance in publicity releases, letters, and announcements, everyone who can assist in making your exhibit successful.

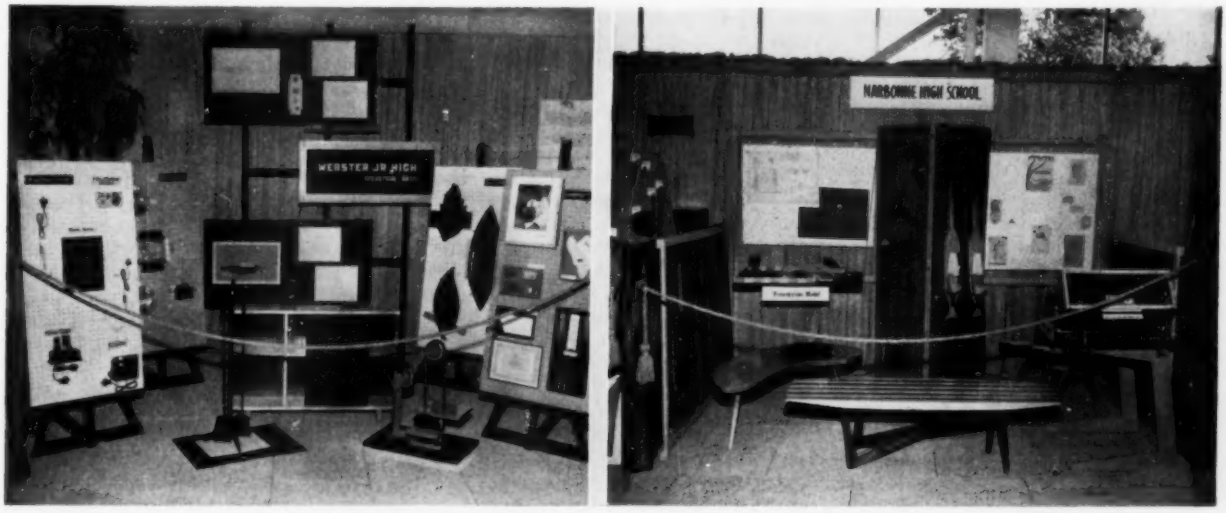
2. *Decide on a Plan of Action*
   - *a*) Inform all industrial education teachers, supervisors, and students concerning tentative plans, objectives, and theme.
   - *b*) Appoint a general exhibit chairman to co-ordinate work of all committees.
   - *c*) Select competent personnel for the necessary committees (in small districts several of committees may be combined).
     1) Financial
     2) Site selection
     3) Exhibit layout
     4) Project (selection and display)
     5) Publicity
     6) Hospitality
     7) Demonstrations
     8) Post exhibit

Assign Responsibilities to Committees

1. *Financial Committee*
   - *a*) Establish the anticipated cost of exhibit.
   - *b*) Make a list of potential financial sponsors (if total cost cannot be met by available school funds).
   - *c*) Prepare a prospectus for use in selling industrial leaders on the value of sponsoring the exhibit. This book should contain pictures of shop activities, newspaper clippings and endorsements by educational, industrial, and civic leaders.
   - *d*) Contact the prospective sponsors through a personal visit.
   - *e*) Do not ask employers for a *handout*. Show them how they cannot afford to withhold their endorsement and support. Show them value they will receive.
   - *f*) Arrange for insurance coverage for the exhibit if needed.
   - *g*) Set up final budget for expenditure of funds based on financial support gained.

2. *Site Committee*
   - *a*) Investigate potential sites for the exhibit.
   - *b*) Make necessary business and legal transactions for suitable site — if not on school premises.
   - *c*) Make a floor plan of exhibit area available and deliver to chairman of Exhibit Layout Committee.

3. *Exhibit Layout Committee*
   - *a*) Obtain floor plan of exhibit facilities from site committee.
   - *b*) Work out display design using:
     1) Booths, tables, risers, showcases.
     2) Areas divided by stands and cord.
     3) Other arrangements.
   - *c*) Determine display arrangement by:
     1) Individual schools.
     2) Geographical areas of the school district
     3) Instructional areas.
     4) Random arrangement.
     5) A combination of the above.
   - *d*) Provide for:
     1) A centrally located display illustrating the exhibit theme.
     2) Elementary school displays.
     3) Junior high school displays.
     4) Senior high school displays.
     5) Junior college displays.
     6) Financial sponsors displays.



Individual school exhibits were arranged through the co-operative effort of the faculty of each industrial-arts department

e) Construct or contract for booths and exhibit equipment, backdrops, according to budget allowance.
f) Obtain or rent necessary electrical cords, special lighting fixtures, platforms, easels, and other equipment.
g) Check with fire department officials to insure compliance with all necessary regulations.
h) Make all necessary signs.
i) Instruct Project Committee as to exhibit space layout, electrical outlets and facilities for exhibit handling.

4. *Publicity Committee*
a) Arrange to have *give away* circulars printed and distributed to all shop teachers.
b) Arrange for billboards, posters, newspaper, radio and television coverage of the exhibit.
c) Request the journalism teacher to accept publicity releases as a class project. Supply him with complete facts, objectives, dates, and human interest stories.
d) Write articles for publications of local and state professional organizations.
e) Write articles for release in publications of the industrial sponsors.
f) Arrange for photographs to be taken for publicity releases.
g) Arrange to have attractive leaflets printed for distribution during exhibit.
h) Report successful completion of exhibit to local, state, and national publications.

5. *Project Committee*
a) Determine number of projects needed to fill the exhibit area creatively and effectively.
b) Devise a method of project selection.
c) Allocate money for transportation of projects and personnel from the various schools if necessary.
d) Print project identification tags providing for:
1) Name of project.
2) Name of school.
3) Name and grade level of student.
4) Name of teacher.
e) Receive and identify all projects delivered to the exhibit.
f) Supervise setting up of project displays.
g) Carry out color, lighting, and placement of theme display.
h) Release and check out projects at close of exhibit.
i) Make provision for protection of displays; roped off areas, closed and locked cases, security guards and insurance coverage.
j) Distribute *Certificates of Participation* to all students entering projects in the exhibit.

6. *Hospitality Committee*
a) Plan and conduct tours of exhibit area.
b) Arrange for "Hi-Fi" background music.
c) Arrange for preview luncheons or meetings with special groups of industrial, civic, and school leaders.
d) Arrange for printing and distribution of invitations to preview luncheon.

7. *Demonstration Committee*
a) Plan at least one booth or area for teacher-student demonstration of school shop activities.
b) Select activities from all instructional areas of the industrial education program.
c) Point out to all teacher-student demonstrators the need of emphasizing the values of the instructional program; the teaching techniques, the learning process, the social value — not just the finished project.
d) Place schedule of activities in front of demonstration area.
e) Call attention to demonstrations over public-address system.

8. *Post Exhibit Committee*
a) Check to see that exhibit area is cleared on schedule.
b) Check with management of facilities used as to final clearance.

Follow-Up After the Exhibit

1. *Recognize those that helped*
a) Send *thank-you* letters to principals and shop department chairmen of participating schools.
b) Send thank-you notes to all teachers who worked on exhibit committee and displays.
c) Distribute *Certificates of Participation* to all students who exhibited project work.

2. *Evaluation*
a) Evaluate the exhibit in terms of:
1) Objectives
2) Attendance
3) Industrialists
4) Civic leaders
5) Shop teachers
6) Parents and students
7) General public
b) Professional co-operation

3. *Report to Sponsors*

a) Make individual reports to sponsors:
   1) Summarizing the program and presentation of exhibit.
   2) Accounting for monies spent.

Local Success Story

The value of these techniques in long range planning and organization with strict attention to details and showmanship, paid off for the shop teachers of a large metropolitan school district this year. Following a year of detailed planning, the Los Angeles Industrial Education Association presented a sparkling industrial education exhibit to the public with the full impact of radio and television announcements, outdoor billboards, newspaper coverage, and two mammoth "Hollywood Premier" searchlights.

In over forty artistically designed booths illustrating the theme "Tomorrow's Craftsmen Today," the activities of the industrial education program on all levels, elementary through junior college was presented through an exhibit of school shop projects.

Organizing for Action

Working closely with the central school district industrial-education supervisors, the executive board of the association initiated plans early in the school year for a city-wide exhibit. At these preliminary meetings exhibit objectives were formulated, a theme determined, a frame work of organization set up and a time schedule of the proposed activities mapped out.

At this point, the number of people participating in the planning was increased by calling a meeting of all the school shop department chairmen to discuss and revise objectives and the proposed plan of action.

With the general planning completed, a general exhibit chairman was selected and chairmen and members of the various committees were appointed. The committees were instructed to work out detailed plans within a budget, coordinate their activities through the general chairman and make periodic reports to the steering committee of the association. During the fall and spring the committees worked to the successful completion of their assignments which are summarized as follows:

Committee Work

Financial Committee: Working throughout the summer months, the committee contacted key industries and by fall the following seven companies agreed to underwrite the cost of the city-wide exhibit: Aerojet, General Corporation, Foster and Kleiser Company, Hoffman Electronics, Incorporated, North American Aviation, Inc., Reynolds Metals Company, Union Oil Company, So. Calif. Tool and Die Manufacturers Assoc.

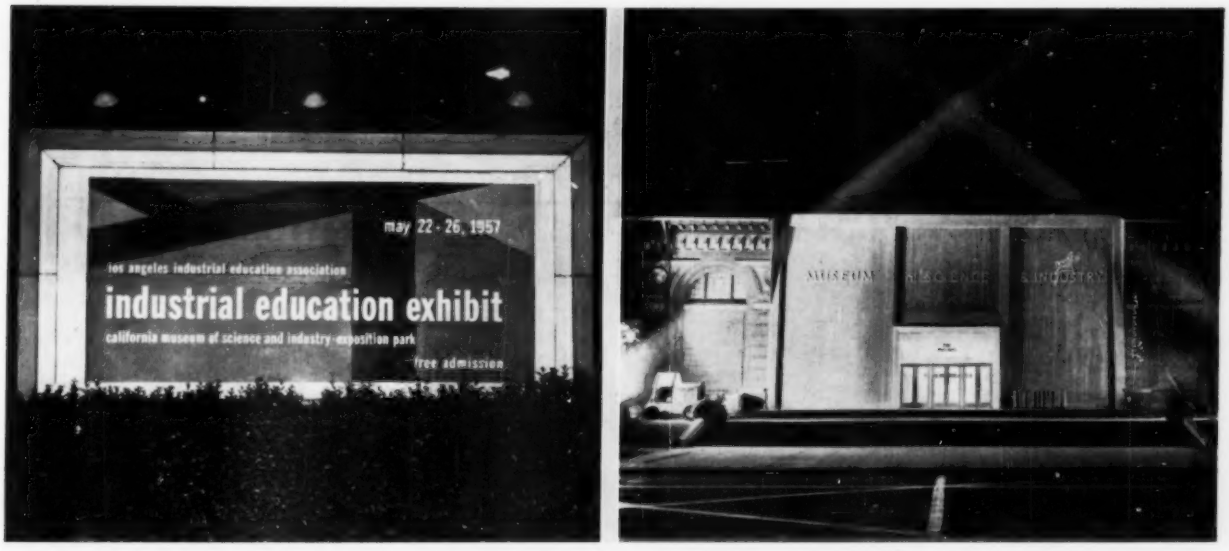
Site Committee: After eliminating several potential sites because of location, size, and rental fees, the committee selected the California Museum of Science and Industry. The Museum is located in beautiful Exposition Park in the center of Los Angeles. The attractive hall in which the exhibit was presented had recently been added to the Museum at a cost of over a quarter of a million dollars. The use of the facility was offered without charge. The only factor causing hesitation was the size of the hall, which was much smaller than the original plans called for and which necessitated reduction in the number of exhibits planned.

Layout Committee: The committee experimented with various ideas, using a scale model of the hall, scale booths, furniture and risers constructed by two instructional shop teachers. The merits of booth arrangement, displays according to areas, and the modern merchandising display techniques were discussed. The committee finally decided on the conventional booth arrangement as being the best approach. A commercial display company contracted to set up the 8 by 10 ft. booths of blue and gray fabric on pipe supports. The booths were laid out to give maximum aisleways for the public, and meet all fire department regulations. The tables, risers, restraining cords across each booth and the fabric material to cover tables were furnished by the dipslay firm.

Projects Committee: The size of the exhibit hall dictated that only a representative number of the schools could enter projects. Those schools sending in the first applications were selected. Booths were assigned to 16 junior high schools, 16 senior high schools, 2 junior colleges, the elementary industrial-arts program and the sponsors. A large area was assigned for teacher-student demonstrations and one area to a school amateur radio station. The shop department head of each school exhibiting received a drawing of the exhibit hall, a picture of a booth with suggestions as to arrangements, tags for the projects, $10 to defray transportation costs, and a schedule for setting up and removing projects.

Publicity Committee: Publicity and more publicity was the *single* assignment of this committee. All opportu-

The elementary school industrial-arts program was represented by a single composite exhibit. (At right) The exhibit of the Los Angeles Trade Tech Junior College


may 22 - 26, 1957
los angeles industrial education association
industrial education exhibit
california museum of science and industry-exposition park
free admission

Outdoor advertising captures public interest. (At right) Searchlights announce opening of school exhibit

nities for publicity were carefully reviewed by this group. The journalism class of one of the junior college classes accepted the writing of publicity releases to newspapers and publications as a class project. These releases were sent to local newspapers on a planned time schedule. Working closely with the Public Information Section of the City Schools, radio and TV coverage was obtained.

One of the sponsors, Foster and Kleiser Company, advertised the exhibit on six strategically located billboards with a very attractive panel. Over 3000 — 13 by 17-in. two color posters were displayed in schools and community buildings; about 25,000 two color informative leaflets were distributed before the exhibit and during the presentation. The monthly newsletter of the association featured a progress report of the developing plans. Two 100-inch "Hollywood Premier" searchlights fanned the night skies during the evening presentations. Committee plans and action resulted in excellent coverage by billboards, newspapers, school publications, industrial publications, television, radio, booklets, and posters.

Hospitality Committee: The duties of this committee included the arrangement of a progress report luncheon for the sponsors two months in advance of the exhibit; arrangements for a preview and luncheon reception for approximately 200 leaders in the industrial, educational, and civic fields of the city and state; and the scheduling of teachers and supervisors to act as hosts throughout the exhibit. At the progress report luncheon held two months before the exhibit reports of the various committee chairmen were presented to the sponsors. The preview and buffet luncheon was held in the Museum prior to the opening to the public and on the first day of the exhibit with several attractive girls acting as hostesses.

Demonstration Committee: This committee scheduled a series of *live* demonstrations, illustrating the central theme "Tomorrow's Craftsmen Today." All fields of the industrial education program were presented in these demonstrations in which both teachers and students participated. In addition a *ham* radio station was in continuous operation throughout the duration of the exhibit by licensed amateur students.

Security and Insurance: Security was furnished by the regular Museum guards and supplemented by an extra guard hired by the committee. Liability, fire, and theft insurance was written to protect the association from any claims or liability.

Follow-up by Steering Committee: Thank-you letters were being written to all participating persons even before the curtains had been drawn across the showcase windows of the exhibit.

Recognizing the value of a recent impression, the various committee members and industrial sponsors were requested to present their opinions concerning the effectiveness of the exhibit. The following guide lines were set up for this evaluation.

1. Did the exhibit meet the objectives established?

2. What was the attendance at the exhibit?

a) Industrialists
b) Civic leaders
c) Shop teachers
d) Shop students and parents
e) General public

3. What was the professional co-operation of teachers?

A report, in the form of an attractive booklet was presented to each of the seven sponsors. It summarized the purposes, planning, and presentation of the exhibit as well as accounting for all monies spent.

Post Exhibit Committee: This committee checked the time schedule to make sure that everything had been removed from the hall; supervised the cleaning of the premises; and with the management of the Museum made a final inspection to make certain that everything had been left in perfect order.

Photograph made by Bruce Henderson, advanced photo student at Tucson Senior High School, and submitted by Harry A. Goldstein, instructor in graphic arts, Tucson, Ariz.

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NORMAN E. MAY
Detroit, Mich.

In the automobile *industry*, the term *body drafting* is so common that it fails to fully describe the importance and romance of its purpose. Actually, it is the expression of ideas and information in the form of drawings, models, and metal templates which makes the production of automobile bodies possible. It should be made clear that the people employed in the Body Design and Drafting Department do not *style* the automobile bodies. While the General Motors Styling Section designs the exterior surfaces and parts of the body from an appearance standpoint, it is the duty of the Fisher Body Design and Drafting Department to develop all of the necessary construction and detailed information so that the design created by the stylist may be produced by mass production methods.

The drawing made by the Styling Section is sufficiently accurate to establish the design and to permit the handmaking of a Fiberglas body to test its appearance. However, for production purposes, extremely accurate three-dimensional drawings must be developed for every sweep, contour, and detail.

The draftsman begins a new design by laying out the surface of the outside of a body. After the outer shell of the body is on paper, drawings are made of the inner surface, hardware, reinforcements, and seats. All lines which eventually describe the appearance of an automobile body are shown full-size on a drawing called the master draft. For purposes of accuracy, master drafts are made on metal plates coated with white paint.

While the layout work is progressing on the master drafts, design problems are constantly arising. To aid in solving these design problems, wood, metal, plastic, or clay models are made to show various structural features.

Drafting is becoming more important in the automobile industry than ever before. At Fisher Body there are more than 80 different body styles each year, with development work on future models bringing the total to more than 200 models being worked on at one time. Adding to this, there are 4000 parts in each body with each part individually designed.

Cutaway of model door is used by young draftsman to help develop contours. It takes several men and many drawings just to design and lay out one door

To those in the body drafting business, the work is both intriguing and rewarding. It requires contact and coordination with engineers, stylists, and production men. In addition to being financially rewarding, it offers a real challenge to young men entering the field and a feeling of satisfaction when the finished automobile is on the road. The body draftsman is truly in the front seat of our present-day world on wheels.

Even though college training in engineering is a valuable aid, a great majority of the jobs in the body design and drafting department are filled by men who took drafting and mathematics (through descriptive geometry) in high school or night school. If a young man is a good draftsman and is willing to learn, the *old hands* in the department can take it from there and convert him into a body draftsman. Beginners with backgrounds in drafting generally start by making drawings of body details. From there they can become layout men, designers — and even go into supervisory work, depending on their capabilities.

Those who wish to enter the body

There are great opportunities for young men who want to play important roles in the planning of new car models

design field and have the opportunity for further training in college should attempt to follow a typical program for freshmen engineers such as the one that follows:

English — composition, literature
Mathematics (algebra, trigonometry, analytic geometry)
Engineering — drawing
Science (chemistry or physics)
Descriptive geometry (½ year)
Shop (½ year)
Physical education or military training.

In order to become a good body engineer, every engineering graduate should spend time *on the board* to familiarize himself with basic drafting practice in the organization. Then, with this background, the engineering graduate is ready to assume greater responsibilities in any one of the many phases of body engineering — he has endless opportunities to demonstrate his initiative and ability.

Bamboo is easily preserved. Clean and dry it. Then apply one or more coats of fresh, white shellac. Allow each coat to dry thoroughly. — *Shellac Information Bureau.*

Beginning draftsman receiving valuable pointers from an "old hand"

Relationship Between Trades Studied and their Application

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Schools have changed. Whether it be by choice, state mandated law or needs of a transitive world, the schools have changed. The multistoried cracker-box institutions have seen their successors of tan brick and expansive glass walls spread over ten acres of spacious landscape. The four-walled classrooms with the pedestal lecture platform have succumbed to the airy, well-lighted workshop rooms dominated by an informal atmosphere. The curriculum once confined to such divisions as Latin, trigonometry, and chemistry has sprung the seams to include names which formerly were found only in industry — auto mechanics, sheet metal, building construction, and machine shop.

It is almost inconceivable to believe that such a transition could be achieved without problems in addition to those which were left unsolved by our now obsolete system. We recognize these problems as a result of the natural course of events which stem from an excess of growth of our schools and population in too short a time. Our objective in this article is not to summarize all of the problems but to isolate the one which is of the most significance to vocational industrial personnel — including the teacher of the academic nature, specifically American history and English. The problem to which I refer, although not of serious nature at first reading, does, when considered, have a potential of great consequence.

The results of an eight-week period of work with stocks and the process of exchange are displayed on the tack board to the rear of one of the two student groups who participate. The flannel board to the rear right displays the fluctuation of the stock purchased. Because of the age of the students and because of the technicalities involving the power of attorney, the stock was purchased in the account of the instructor, James W. King. The stock certificates and the material used in the study of the exchange of stock are shown on the tack board

How can an academic teacher stimulate a class of vocational industrial students to recognize the direct relationship between the trade they are learning and the social and economic forces which will govern their ability to apply that trade?

The conclusion drawn and the situations presented here are based primarily on one locality. However, society and its conditions permit the assumption that these conditions are not confined to one locality, but are universally true.

The boys placed much importance upon becoming proficient at their trade. This was a natural trend and a gratifying one. Possibly the motivations back of their interest in their trade were:

1. It was a skill which they could learn to a high degree of efficiency.

2. The reward for such efficiency was an increase in earning power.

The attitude of the boys toward the *related* courses of English and history, however, at times appeared to be one of relative insignificance.

F. C. Cornell in a paper presented to the National Council of Social Studies at Cleveland, Ohio, stated that vocational education alone was a failure. In this age a measure of fluctuation is expected in all business. In the event of a recession the less prepared can expect to follow the work from one locality to another. This fluid trend in the shift of population makes it necessary for the individual to be mentally well adjusted to adapt himself to different societies, employment situation, and localities. Vocational and social education is essential. One without the other, although not useless, is dangerous.

Because of salary considerations, various manual-arts vocations have become desirable. This is more evident now than at any time in the past. Parents have influenced the child to pursue such courses. This has induced the students to apply for admission to the vocational-industrial department of the local high school. The large number of the applicants to this course has enabled the department head of the vocational-industrial department to become selective in his choice of applicants. Herein lies the reason for the comparatively higher standard of students in this division of the curriculum.

The students selected, however, have been attracted by a high wage reward upon completion of their qualifying courses. The academic courses which accompany such courses are suffering in direct proportion to the emphasis placed upon learning a profitable vocation. In fact, there has been an almost complete disregard of the importance of the *related* subjects. This conclusion is based on the results of the standardized tests in which the boys scored average grades, as compared to school tests and examinations in which the grades of the students in question are far inferior.

The *shop boys* think of themselves as being separate and apart from the rest of the student body. However, they have developed an espirit de corps among themselves which encourages a division between the students. By now the vocational-industrial groups seem to take a sadistic delight in maintaining this line of segregation which they themselves have drawn. The violation of the use of basic English has become a trademark of the shop boys and is worn like a badge of identification, proudly, and in a conspicuous manner.

When, as a group, the shop boys are

Applying the principle of capitalists and citizens these students are seeing the "big board" in person. Walston and Company, a member firm of the New York Stock Exchange, made their office staff available for two full afternoon sessions of trading. The Dow Jones Averages was but one phase of the operation explained by Jack Hershey, a member of the Hagerstown, Md., staff

confronted with disciplinary and academic records which prove their adverse attitudes, they take on a tone of *self-pity* and with an overtone of pride refer to themselves as *orphan Annies*. All of the attempts to break through this division line meets with failure and further strengthens the defense of the boys against taking on the interests and pride of the other students.

The students have demoted the *related* subjects of their course to a less important position than their vocational industrial courses. The major amount of interest and energy of the student is placed in the learning of his trade. History and English are not given the proper amount of importance by the student. A student of the trades cannot be ignorant of the responsibilities which accompany the privilege of applying his trade. The welfare of a tradesman does not lie in the proficiency at his trade, alone. His process of correct thinking and his participation in democratic procedures such as voting will determine whether or not he may have the opportunities to use his trade. The future craftsman should develop his thinking process so that he may reach decisions by his own convictions. To accomplish this, it is necessary that the student be able to distinguish between misguided or camouflaged opinions, ulterior motives, hidden incentives, lethal *jingoisms*, and wholesome, honest reports and opinions.

Various schools meet this problem in a variety of ways. Some teach a course called economics, while others call their course sociology. In Chambersburg Senior High School the vocational-industrial boys study American history in the tenth and eleventh years. Known respectively as social science I and social science II, the years are divided into American history before 1865 and American history after 1865. This leaves the Senior year for the study of what is called social science III.

Briefly, this social science III was a nondescript arrangement of events which were currently in the news. This can't be judged as a poor arrangement but it is decidedly inconclusive. The newspapers should be included in the study, but not for the purpose of news, alone. Remembering that these students are inclined in a mechanical manner, the technical aspects of the newspaper and newspaper plant should be explored. Films are available which break down each step in the publishing of a newspaper. The prearranged tour of a local newspaper plant lent visual and actual experience which climaxed a conclusive study of newspaper printing.

After exhausting the technical field, an inclusive study of newspaper make-up and content takes approximately three weeks. In this study everything from syndicates to classified advertisements is studied. This is the springboard for the study of extension work. In the process of such study, students keep a record of such items as major headlines of the day, questions of banking and finance, the operation of syndications and big business, the function of unions and labor-management relations.

These boys do not study about capitalism — they are capitalists. Reading material which eventually lead them to choose American Safety Razor stock because of its yield value, the students made detailed notes and charts involving some thirty different stocks. The price of the stock when purchased was seven dollars and seventy three cents

The tack-board display represents an eight-week study of labor and management problems. This particular display dealt with a Westinghouse strike and the paid advertisements of both management and labor. Actual examples of the methods each employ to fight the other and the results of each method are posted in a chronological order. The display was a product of the Vocational-Industrial class

This year's class by a popular vote decided to study finance. It had a basic appeal, in so much as it too dealt with money. The stock exchange offered a challenge and the boys were eager to learn all they could about speculation. No added incentive was needed. With aid from films supplied by the Wall Street Journal, the American Stock Exchange, and the New York Stock Exchange and audio and visual aids from local brokerage houses the students, and teacher, learned to handle such terms as *marginal buying, puts and calls, selling short, options, in a corner, stop and limit order, odd lot differential* and many more. The unit or area could not be dropped as easily as it had began. The fuse was lit and the boys were excited.

A collection or contribution was contributed by each boy, totaling some eighteen dollars. With this money they intended to actually purchase a share of stock. To prepare themselves, they made a personal choice of a stock and kept a chart showing its progress day by day. The stock supposingly was selected because of its value in (1) growth, (2) yield, or (3) speculative powers.

After a week of progress, the charts were compared and by consultation with records showing corporation earning, investments, debts, and diversifications, all were eliminated but one. The boys then were ready for their investment.

Arrangements were made with the brokerage concern of Walston and Co., to visit their Hagerstown, Md., branch office. Here the boys could actually see their theory put to practical use. Their order (one class purchased one share of American Safety Razor and the other class purchased one share of Certainteed Products) was received wired to the Exchange and confirmed while they watched. Later their order was sent through on the translux screen while they observed the fluctuation on the *Big* board and the *Dow Jones Averages*.

Upon the return to class, confirmation orders, receipts, and bills were filed on the tack board along with all data and clippings used in the course or unit on stock and the process of exchange. When the actual certificates of stock arrived they were posted with the brochures of the industry and large charts showing the fluctuations of each were kept on a large flannel board.

The intense interest was not confined to the vocational-industrial students but spread to all the students of the school. The classroom took on the aspects of a brokerage office.

In the process of this unit business was studied showing single ownership, partnerships, corporations, trusts, and holding companies. The strength of this unit lay in the strengthening of confidence in big business. The attitude of ownership as it was opposed to the attitude of the labor movement.

It was but a step and a half from the study of management to the study of labor organization and unions. Since the boys spent alternate weeks, one in the shop and the next in the classrooms, it was a natural procedure to form their own labor union. Study of unions and their history, study of the need of such unions, study of communist and racket infiltration of unions, all led to a more sincere desire to participate in a personal union. The strikes in progress were studied with more enthusiasm than Steve Canyon or Dick Tracy. The newspapers, formerly a sports page bordered on both sides by small print was now a living instrument of measurement. The financial pages, the classified advertisements (employment wanted) the front page strike news, all lent an impetus to the class which a year ago would have gone begging for attention.

The boys can now talk of a stereotype and a galley proof with a command of authority. They can read of a closed shop, sympathy strikes, Taft-Hartley laws and shop representation with a composure brought about by a sense of understanding. They know how to hypothecate stock and how to read a financial page. These boys didn't just study capitalism. They were practicing capitalists who sacrificed a gallon of gasoline or a piston rod to buy a piece of America. Most useful of all, they are able to judge all they read with a soundness or realism not before possessed.

This course of study not curtailed by textbook or tradition, has satisfied a need for a more personalized course of related social science. The responsibility for the boy's future can be securely lodged with the boy himself. He realizes he must build a political and moral table of values or standards to which he may refer. Just as he was responsible for the work and progress he derived from his class so this same yardstick can be made to apply to his life, social and professional, after he has left school.

We think that the set of standards created by the students can be used successfully to measure political personalities, theories, objectives, and practices. By so doing, we feel the boys can measure sincere and conscientious purposes against selfish and prejudiced motives. In developing mature attitudes we believe the vocational-industrial course graduates will enhance their professional positions by demonstrating co-operative, open-minded sincerity.

Graphic-arts student Bill Van Dyke setting type from the California Job Case. Instructor, Mr. Klenck. Photograph by Frank Peterson. Submitted by Harry A. Goldstein, graphic-arts instructor, Tucson Senior High School, Tucson, Ariz.

Guiding Principles for Industrial-Arts Teachers

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Teaching industrial arts challenges the highest level of ability and professional training. In the Detroit public schools a high degree of individuality has been encouraged among the teachers which has resulted in the use of a wide variety of techniques, methods, and subject matter content. This encouragement in initiative has been good, because there has been developed here one of the finest, most enriched programs in the country.

The freedom and encouragement given teachers to exercise initiative should not be misinterpreted to mean that the scores of teachers in our several schools do not conform to some basic or underlying principles of operation. The opposite is true. There are several of these to which we are definitely committed. The following 14 statements are an attempt to give some of the things to which many successful teachers have subscribed over a period of years and have found good. They should be considered as criteria to evaluate a successful industrial-arts program.

1. Teacher Planning

To construct a well-designed building, to build a beautiful car, to erect a sturdy bridge requires extensive planning. To mold the minds of the future citizens of our nation also takes planning, a great deal of planning. The teacher who is still trying to teach "off the cuff" is doing his students a great injustice. The program becomes stereotype and many important items that should be presented are neglected.

Good teacher planning involves:

1. Selecting activities and information to be taught.
2. Developing typical projects with multiple designs.
3. Making a plan for a semester's work.
4. Writing project teaching plans.
5. Developing organization lessons.
6. Developing special lessons on related information.
7. Preparing lessons using audio visuals.
8. Correlating selected references with current work.
9. Developing unit, special, and semester tests.

2. Teach Something Each Day the Class Meets

During the time that a teacher has a group of children as his students, it is impossible to convey all of the knowledge which is concerned with industrial-arts education. It is therefore necessary for the teacher to do a careful job of selecting and planning the information that is to be taught. A careful job will result in a semester plan of work for each course taught with short lessons planned for each time the class meets. With careful planning all essentials are covered. By presenting a short lesson each time the class meets, the lessons are better organized, the lessons are better adapted to the students' span of attention, and more information is covered during the term.

3. Selection and Designing of Projects

The project is the vehicle that is used by the teacher to give students experiences in the performance of selected tool and machine operations and related information. It is the center of interest which stimulates the child to want to learn, to perform, to create, and to grow. The projects, then, must be selected with care to meet the needs of the student, the community and the philosophy of the educational program. In terms of our present-day thinking, a project should be useful; it should be possible to make it in a multiple of forms so students can apply their own design; and it should involve a combination of materials so that it can be constructed around the shop. When it is finished, the student should be proud of the results.

4. Developing and Using Teaching Aids

A teaching aid is any device or piece of equipment used to help students to understand and learn. This discussion is only concerned with those which are constructed by the teacher for a specific teaching situation. To enliven the demonstration, discussion, or lecture, to make it easier for the student to understand, the teaching aid is an essential part of the teacher's repertory.

Teaching aids should be constructed after a great deal of thought. The teaching aid should not only be designed to perform the function for which it is intended, but should also be well constructed, attractive, and ornamental.

Because it takes considerable time to construct suitable teaching aids, teachers should make plans well in advance of the need. By developing a few well-designed teaching aids each year, the teacher will in time have on hand those aids which will make his teaching more meaningful.

As a common rule, teaching aids should be on display only during the time they are in use. Continuous displays causes them to lose much of their educational value.

5. Student Planning

To perform basic operations in selected activities is the principal aim of industrial-arts education. To be a skilled person an individual must learn to design, plan, and organize his work. Teaching students to plan, therefore, is an essential function of industrial arts.

It can be accomplished by following these four steps of planning:

1) Teacher-directed planning.

2) Co-operative student-teacher planning.

3) Student planning of suggested project.

4) Student planning of an original project.

Student planning can best be accomplished through the use of planning books or planning sheets in conjunction with instruction on basic operations and related information.

6. Student Evaluation

When students are asked to participate in the evaluation of their projects, the teacher has provided a real educational opportunity. A student makes progress and develops skills more rapidly when he learns to detect the flaws of his own labor. It is imperative that the teacher provide for student evaluation of projects. The evaluation procedure can be accomplished when the necessary mechanics for doing the job are provided on the planning forms. Student evaluation can be achieved by:

1) Having each student evaluate his own project.

2) Having one or more other students evaluate the project.

3) Having the student and teacher evaluate the project.

Good student evaluation encourages workmanship, improved design, better pupil-teacher relationship, and community interest in industrial-arts education.

7. Student-Directed Organization

A student-directed organization is an intrinsic part of the Detroit industrial education program. Each teacher should plan, organize, and direct his educational program so students will receive the maximum participation from this organization. The student-directed organization is not a monitor system, but rather a program which will provide for the following experiences:

1) Opportunity for students to gain leadership ability by assisting with the operation of the class.

2) Opportunity for children to learn to give and take directions from individuals their own age as well as from adults.

3) Opportunity for children with little manipulative skill to excell in another area.

4) Opportunity for students to work in an atmosphere which is similar to that of industry.

5) Relieves the teacher of many routine duties to the end that the teacher can devote his time to instruction.

A well-established student-directed organization gives students practical experiences in social development.

8. Housekeeping

Maintaining a shop so it has a neat, well-ordered look is one of the important requirements for teaching industrial arts. Housekeeping is a prime responsibility of the class. Children are better behaved and accomplish more when they have a cheery, clean, orderly room in which to work, and much good comes to the children when they assume responsibility of keeping the room clean and orderly. Housekeeping is not a spasmodic operation which is performed at the end of the week, month, or term, but rather one that is in continuous process throughout the school year. Projects, pictures, teaching aids, and shelves need dusting; benches need to be refinished; machines need to be repainted; floors swept; cabinets cleaned out and items neatly stored; toolholders rebuilt and tools rearranged, and many more. The teacher who makes a careful study as to when, how, and who will do the work, and then puts his plan into the hands of the children for operation will always have a shop in which students will enjoy working.

9. Use of Materials and Equipment

Materials and equipment are distributed as equally as possible among the various schools on a student hour basis according to the funds available. Some teachers find the amount of material supplied by the board of education more than sufficient to meet the needs of their students. In fact, they always have a surplus. A few teachers, on the other hand, are always running short of materials and are frequently in need of new equipment. The reason is that some teachers plan and use the materials and equipment more efficiently than others. Some teachers also supplement the materials received with salvage materials which they obtain from neighboring industries, and which are also brought in by students.

It is important to select and design projects which will make it possible to use the materials available. It is also important to encourage students in the proper care of equipment so available funds can be used for materials and not for the replacement or repair of equipment.

10. Storage of Materials

The method of storing materials will vary with each shop, depending on the facilities available. The ingenious teacher makes use of every available space, thus creating more space when necessary.

Every effort should be made to provide space for the students' projects, materials, teaching aids, books, and teacher plans. All such items should be stored so they are neatly arranged, available, and easily inventoried.

11. Safety Program

A safety program is an integral part, not something separate and apart, of the instructional program of industrial-arts education. Each teacher is responsible for developing a safety program which is best suited to the subject taught in the shop. This program should include the providing of:

1. Safe working conditions.
2. Personal safety instruction.
3. General safety instruction.
4. Safety instruction on materials and equipment.
5. Safety tests on general regulations and each machine.
6. Daily safety inspection.
7. Special lessons on safety (audio-visual, fire drills, etc.).
8. Safety materials (posters, pledge, permission from parents to use equipment, record of safety instruction, etc.).

The safety program should not be limited to just the school situation, but should have sufficient breadth to include the home, streets, play, and industry.

12. Use of Text and Reference Materials

Every shop has a reference shelf containing an assortment of titles which places at the finger tips of every teacher a wealth of information in the form of books and pamphlets. Correct procedures on how to perform operations, information on related topics, and suggestions for projects are available. Teachers would do well to use this source of information extensively. Students especially have to be taught to use this reference material because after they leave the school, the written word becomes their major source of information. Successful teachers will emphasize the use of the reference books equally with the use of tools.

13. Audio-Visual Aids

The Detroit public schools have developed an extensive library of audio-visual materials in the form of sound film, silent film, slide film, and slides. Many of the films are on industrial arts and vocational subjects. These films are described in a film catalog which can be obtained from the principal. A teacher should review the film catalog and select those that are suitable for his teaching situation. When developing the semester's plan of work, the films can be scheduled for the time they are best suited for instruction. It is well to select the films that are to be used for the term and order them all at the same time, well in advance of the first scheduled date.

Another source of visuals is the Children's Museum. It would be well for teachers to become acquainted with this source and use the available materials for display purposes. Visitors are welcome.

14. Teaching a Full-Time Job

Teaching is a full-time job, and to be a master teacher requires long hours of planning, writing, and building both in and out of school. The teacher who dedicates himself to his work may not receive any extra monetary award, but he will achieve results and satisfactions far beyond his highest imagination. In the final analysis a teacher can remember with satisfaction his achievements as measured by the appreciation of satisfied students.

The Terminology of Occupations

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All teachers are concerned vitally with the world of occupations. Helping students to understand vocational opportunities and to make sound choices are important educational responsibilities. Occupational information is a complex and ever growing field of knowledge. The "D.O.T." (Dictionary of Occupational Titles), for example, already describes more than 22,000 occupations.

Despite important new developments in our learning about occupations, many terms are used that are not clearly defined. Even experienced vocational and industrial-arts teachers are not always secure in occupational terminology.

With the aim of encouraging clarity and uniformity in usage, the occupational literature was examined, and the following alphabetical list of defined terms was compiled. Credit is assigned wherever possible.

1. *Apprentice:* A worker who learns, according to a written or oral agreement, a recognized skilled trade, requiring two or more years of on-the-job experience, supplemented with related instruction — after D.O.T. (See also journeyman and master.)

2. *Automation* (also called cybernetics): The helping of man's senses and mental power by devices which collect and process information, transmit it where needed, and there control machines or deliver information to be used.

3. *Barden-Lafollete Act* (Vocational Rehabilitation Act of 1943): One of several important federal laws providing vocational rehabilitation services through the states for handicapped persons (including emotionally or mentally ill) over 16 years of age. Services include medical examination and treatment, counseling, vocational training, and placement.

4. *Building Service Occupations:* Occupations concerned with cleaning the interior and equipment of buildings, offices, stores, and the like, and with moving or carrying equipment, baggage, and other articles. *After D.O.T.* (See also service occupations, and domestic, personal, and protective service occupations.)

5. *Business Concern or Firms:* One or more establishments where business is conducted, or where services or industrial operations are performed, under the same ownership and general control. (See also establishment and industry.)

6. *Career* (Career Pattern): The sequence of occupations in the life of an individual or of a group of individuals. — *Donald E. Super.*

7. *Clerical Occupations:* Occupations concerned with the preparation, transcribing, transferring, systematizing, or preserving of written communications, and records in offices, shops, and elsewhere. *From D.O.T.*

8. *Capital Goods:* Economic goods not used directly, but designed to produce other goods. (See also consumer goods.)

9. *Consumer Goods:* Economic goods that satisfy directly human wants or desires. Examples are food, clothing, and the like. (See also capital goods.)

10. *Co-operative Education:* A program providing for both study in school, and schooltime devoted to employment in industry or business. The employment may be for half of each school day, on alternate weeks, or on some other basis. The employment is planned and supervised by the school.

11. *Co-ordinator:* A member of the school staff responsible for integrating the classroom instruction and the on-the-job activities of the employed student. The co-ordinator acts as liaison between the school and employers in programs of co-operative education or other part-time job training. *From American Vocational Association.*

12. *Craft:* An occupation in which tasks are planned and performed with the skillful use of hands, and hand tools

or other equipment. Often there is responsibility for carrying the making of a product from raw materials to finished article.

Maintenance or repair of the machines used is generally not required. After Max Baer and Edward Roeber. (See also machine trade and trade.)

13. *Disability:* A condition of impairment, physical or mental, having an objective aspect that can usually be described by a physician. — *Kenneth W. Hamilton.* (See also handicap.)

14. *Distributive Occupations:* Occupations in which workers are engaged directly in merchandising activities in contact with buyers and sellers when (1) distributing to consumers, wholesalers, retailers, and others the products of farm and industry, or selling services; (2) managing, or conducting a retail, wholesale, or service business. — *After American Vocational Association.*

15. *Diversified Occupations* ("D.O. Program"): A federally subsidized high school vocational preparation curriculum. Students receive classroom instruction and supervised work experience, mainly in trade and industry. The program functions chiefly in small communities where worker needs in any one occupation are too small to justify school shop instruction. — *After American Vocational Association.*

16. *Domestic Service Occupations:* Occupations concerned with the maintenance of households, preparation of meals, care of children, and other services performed in private homes. (See also service occupations, and building, personal, and protective service.)

17. *Entry Occupation:* An occupation in which a person lacking previous work experience may be employed.

18. *Establishment:* A single physical location where business is conducted or where services or industrial operations are performed. — *From Standard Industrial Classification Manual, U. S. Govt.* (See also business concern, and industry.)

19. *Fitzgerald Act* (The National Apprenticeship Law of 1937): The purpose is to bring together employers and labor to develop programs and to cooperate with state agencies in formulating apprenticeship standards. By this law, the Bureau of Apprenticeship was established in the U. S. Dept. of Labor.

20. *Foreman:* A person who supervises a group of workers in a craft or industrial process. He interprets written or verbal orders, determines procedure of work, assigns duties, inspects work, and maintains harmony among workers. He may keep records, and employ, train, or discharge workers. He must be skilled in the craft, or have detailed knowledge of the industrial process. *After D.O.T.*

21. *G. A. T. B.* (General Aptitude Test Battery): A battery of 15 tests, developed by the United States Employment Service. Tests are of pencil and paper, and apparatus type, and are administered without charge to adolescents and adults by the local Employment Service. It secures aptitude data for use in vocational counseling.

22. *General Education:* Education on a broad basis aimed at developing attitudes, abilities, and behavior considered desirable by society, but not necessarily preparing the learner for specific types of vocational pursuits. (*After Charles V. Youmans.*)

23. *George-Deen Act:* A federal law enacted in 1946, extending the provisions of the 1917 Smith-Hughes Law supporting public vocational education. A significant provision was that a portion of the funds could be applied by the states to promoting guidance services, including research, counselor training, and local assistance. (See also George-Barden and Smith-Hughes Acts.)

24. *Handicap:* The extent to which a disability lowers the maximum functioning level of a given person. This is subjective, and varies among individuals. (See also disability.)

25. *Helper:* A worker who assists another by performing duties, usually of lesser skill, such as supplying materials and tools, loading, cleaning, machine feeding, or other operations. In contrast with the apprentice, there is no expectation that the helper will be taught a trade by the employer.

26. *Incentive Work or Wage* (See Piece Work.)

27. *Industrial Arts Education:* A branch of practical arts education. Shopwork is provided of a nonvocational type, consisting of general educational experiences relating to industrial and technical aspects of living. Orientation is offered in appreciation, production, consumption, and leisure activities, through actual experiences with materials and tools. *After American Vocational Association.* (See also practical arts education.)

28. *Industry:* A group of independent but similar establishments where business is conducted, or where services or industrial operations are performed. (See also business concern and establishment.)

29. *Jobs:* A group of similar positions in one plant, business, institution, or other workplace. — *Donald E. Super.* (See also position, occupation.)

30. *Job Analysis:* An intensive detailed, direct method of obtaining the pertinent facts about jobs. It includes observation of the job and the reporting of facts which are observed or obtained in conversation with workers, supervisors, and others who have significant information. (*After Carroll L. Shartle.*)

31. *Job Description:* Organized information that identifies, defines, and provides a detailed picture of the duties, responsibilities, and qualifications of a job. (See also occupational description.)

32. *Job Shop:* A manufacturing establishment which produces a variety of commodities, each one in relatively small amounts, according to varied needs of purchasers. (See also jobber and specialty shop.)

33. *Job Specification:* Essentially a written description of the skills, preparation required, and the physical demands of a job. It is especially useful as a guide to the interviewer in hiring.

34. *Job Survey:* Information about jobs obtained indirectly by written questionnaire or personal interview of workers, supervisors, and others, without observing the job. (See also occupational survey.)

35. *Jobber:* A wholesale dealer in a variety of commodities not of his own manufacture. Stock is obtained as ordered by his customers or by small "job-lot" purchases for stocking. (See also job shop and specialty shop.)

36. *Journeyman:* A skilled worker who has completed successfully an apprenticeship and is fully qualified to practice his craft or trade. (See also apprentice and master.)

37. *Labor Force:* Total number of employed persons, *plus* those who are seeking work at any given time. (Employed and unemployed are included.) — *From Carroll L. Shartle.*

38. *Machine Trade:* Involves the planning and performance of tasks requiring skillful use of tools and equipment and an understanding of how machines operate. This understanding may be needed to maintain, adjust, or repair equipment, or to perform complex machine operations. *After Max Baer, and Edward Roeber.* (See also craft and trade.)

39. *Managerial and Official Occupations:* Professional workers involved primarily with responsible policy making, planning, supervising, co-ordinating, or guiding the work activity of others, usually through supervisors.

40. *Manufacturing:* The working, by hand or machinery, of raw or partly raw materials into suitable forms for use, according to an organized plan and with division of labor.

41. *Master:* A worker who has attained a high degree of proficiency in a skilled craft or trade, and who employs or supervises journeyman or apprentices. (See also apprentice and journeyman.)

42. *Occupation:* A group of similar jobs found in more than one establishment. (See also job, position.)

43. *Occupational Abstract:* Brief de-

scription, about 1500 words long, of an occupation, with information such as qualifications, preparation, entrance and advancement, employment prospects, distribution of workers, earnings, and advantages and disadvantages. Its use is mainly for students and counselors. (See also occupational brief and occupational monograph.)

44. *Occupational Brief:* An occupational description similar to occupational abstract, but is about 3000 words long, and may contain illustrations. (See also occupational abstract and occupational monograph.)

45. *Occupational Description:* This is similar to the job description, but is more general because it describes a group of similar jobs in more than one establishment. (See job description.)

46. *Occupational Family:* Occupations that are grouped or related because of one or more significant characteristics, such as education, finger dexterity, strength, machine skill, and the like. Family groupings have a special use, and can be developed around a single occupation, within an industry, within the armed services, or within a plant. *After Carroll B. Shartle.*

47. *Occupational Monograph:* An occupational description that is much longer than either an abstract and brief (4000 to 8000 words). Pictures may be included, and related occupations may be described. Information covers areas like: history, importance of occupation, number of workers, need for workers, duties, qualifications, preparation, entrance, advancement, earnings, hours, and hazards.

48. *Occupational Survey (Community):* Systematic compilation of data enumerating and describing jobs within a defined area, usually for establishing training programs or ascertaining employment needs and opportunities. (See also job survey.)

49. *On-the-Job Training:* Training of various kinds in industry provided by the employer. Generally it involves job processes and is given during regular working hours while the employee is being paid. Apprenticeship is one form of on-the-job training, but the term is more properly applied to shorter, less complex occupations than those requiring apprenticeship.

50. *Opportunity School:* A school providing specialized courses to meet varied adult needs, such as vocational training, retraining, naturalization, and literacy classes. *After American Vocational Association.*

51. *Personal Service Occupations:* Occupations in which services are performed for people, that usually require direct contact or close association. *After D.O.T.* (See also service occupations, and building, domestic, and protective service occupations.)

52. *Piece Work* (Incentive Work or Wage): Work paid according to amount or number of units completed, rather than on the basis of the time employed each day or week.

53. *Position:* A group of work tasks performed by one person. There are always as many positions as there are workers. *After Carroll L. Shartle.* (See also job, occupation.)

54. *Practical Arts Education:* A kind of general education of a shop nature providing learning in the areas of technology, industry, manual skills, and leisure-time interests, guided by consumer rather than specific vocational goals. Agriculture, business education, fine arts, homemaking, and industrial-arts education are phases of practical-arts education. *From American Vocational Association.* (See also industrial arts education.)

55. *Production Work*: Manufacturing or processing in which many units of a similar kind are produced. This kind of work ordinarily lends itself to division of labor.

56. *Profession:* Occupations requiring much mental activity concerned with theoretical or practical aspects of complex fields of human endeavor. These occupations require considerable academic study, the equivalent in special experience, or a combination of both. *After D.O.T.* (See also semiprofession.)

57. *Protective Service Occupations:* Occupations concerned with the protection or guarding of the country or its political units, of buildings and other property, and of individuals. *From D.O.T.* (See also service occupations, and building, domestic, and protective service occupations.)

58. *Rehabilitation, Vocational:* Is applied to a handicapped person whose physical or mental disability is a substantial handicap to employment. Medical or surgical therapy, counseling, education or other special preparation for employment, and placement in suitable occupations, are provided as needed. (See also Barden-Lafollette Act.)

59. *Salary:* A stipulated recompense paid at regular intervals to an employed person for services rendered. The term generally applies to professional or supervisory personnel, and may or may not include additional pay for *overtime* service. (See also wages.)

60. *Sales Occupations:* Occupations concerned with the sale of commodities, investments, real estate, and services. *From D.O.T.*

61. *School-Work Education* (See cooperative education.)

62. *Semiprofession:* Occupations concerned with theoretical or practical aspects of endeavor requiring extensive education or practical experience, or both. Such occupations are less demanding in preparation or need for initiative or judgment than are the professions. Semiprofessions are typically concerned with technical or mechanical details of broader and possibly more theoretical fields. *After D.O.T.* (See also profession.)

63. *Semiskilled Occupation:* A manual occupation requiring a high manipulative ability, limited to a rather well-defined work routine. Judgment may not be high, but alertness is needed to prevent damage to product or equipment. Judgments are limited to a narrow field of responsibility and important decisions are made by others. The work may represent a limited segment of a craft or skilled trade. *After D.O.T.*

64. *Service Occupations:* A broad field of occupations devoted directly to serving the needs, comfort, and safety of people. Repairman, tradesmen, or equipment *servicemen* are not in this group. (See also building, domestic, personal, and protective service occupations.)

65. *Skilled Occupation:* Craft and manual occupations requiring thorough knowledge of the processes involved in the work, the exercise of considerable independent judgment, usually a high degree of manual dexterity, and sometimes responsibility for valuable product or equipment. The skill is usually acquired by apprenticeship or other extensive preparation. *After D.O.T.*

66. *Smith-Hughes Act:* The basic federal vocational education act, passed in 1917, providing financial aid to the states in encouraging public vocational education of less than college grade for persons over 14 in agriculture, trade and industries, and home economics. *From American Vocational Association.* (See also George-Deen and George-Barden Acts.)

67. *Specialty Shop:* A business or manufacturing establishment which produces or merchandises continually a relatively small variety of articles. (See also jobber and job shop.)

68. *"Stealing" a Trade:* Learning a skilled trade in an incidental fashion, with no formal training program. The term carries no implication of dishonesty or improper practice. (See helper, on-the-job training, and apprentice.)

69. *Technical Education:* A program of formal education with emphasis on practical applications of scientific knowledge and methods.

70. *Technician:* A worker in an occupation requiring applied technical knowledge and skill. The work is frequently akin to that of the engineer, but of narrower scope. Special training of from one to three years beyond high

school graduation often is required.

71. *Technocracy:* The government of society by technical experts, or according to principles developed by such persons.

72. *Technology:* Scientific knowledge and methods put to practical usage.

73. *Trade:* An occupation, exclusive of a profession, requiring manual or mechanical training and dexterity in which skill is applied to the design, manufacture, servicing, or repair of manufactured products. (See also craft and machine trade.)

74. *Unskilled Occupation:* A manual occupation involving performance of simple duties that may be learned within a short period of time and require little or no independent judgment. Usually previous experience is not required. There may be heavy physical work, or only a minimum of physical exertion. *From D.O.T.*

75. *Vestibule Schools:* Brief, intensive organized instruction provided by the employer in the plant for new employees or for experienced workers shifted to new positions. Actual processes and equipment are involved, but they are apart from the main production.

76. *Vocational Education:* Education intended to prepare for entrance into a specific vocation, or for upgrading of persons already employed. The term is commonly limited to vocations below the collegiate level in preparation, but including technicians.

77. *Vocational Guidance:* The process of helping a person to develop and accept an integrated and adequate picture of himself and his role in the world of work; to test this concept against reality and to convert it into a reality, with satisfaction to himself and benefit to society. — *Donald E. Super.*

78. *Wages:* Recompense given on a time basis to workers engaged in manual or mechanical occupations. Additional pay is customarily given for "overtime" work.

Reproduction of Shop Drawings—Part VII

LAWRENCE S. WRIGHT
Assistant Professor of Industrial Arts
Iowa State Teachers College
Cedar Falls, Iowa

Techniques for Class Use

Those who include the reproduction of shop drawings as a part of drawing room instruction, regardless of the process they use, will admit that such a process is an excellent motivating device. The boys can hardly wait to finish a drawing so that they can reproduce it. The wise instructor will allow only such drawings as may be of a modest standard of quality to be reproduced. One can add strength to the motivating powers of the reproduction of shop drawings by varying the processes used from the blueprinting process, the Vandyke process, the moist diazo process, to the dry diazo process. Students will enjoy choosing papers in different colors as well as selecting developers or papers which will give different colored lines.

One very effective way to introduce the reproduction of shop drawings is to use one of the processes to show students the quality of line work that their pencils and pens may characteristically be expected to do. Each student may use his 6H, 4H, 2H, and H pencil, his No. 4 Henry tank pen, No. 12 Henry tank pen, and fountain pen. It should be pointed out that the objective of this exercise is simply to find out what these fundamental draftsman's tools will do. Each pencil is used to sketch both a light line and a heavy line. Using a uniform average pressure the pens are used to draw an ink line. When the exercise is completed, a reproduction is made. The students readily see the variation between line weights of a given pencil, the contrast in lines made with different pencils, the contrast between pencil lines and ink lines, and the contrast between the use of India ink and ordinary ink. Furthermore, they are introduced to the relationship of the drawing to the print and the general information of how to make a reproduction of a drawing.

An optional project that students frequently enjoy is the development and layout of an original Christmas card to be reproduced in one or two colors by one of the diazo processes. Blueprinting may also yield attractive Christmas cards.

How many schools include a unit of instruction on the reproduction of shop drawings? Even a casual observation will reveal that most schools give instruction only in the process in which they are equipped to make reproductions of drawings. Others, having no equipment, simply do not include such instruction. It is *not* recommended that instruction in the use of reproduction of shop drawings be included at the expense of developing skill and adding information in drawing; but, rather, to supplement this goal. It seems to the writer that because of its interest value and because of the additional opportunity to gain an insight into modern industrial operations that schools should include in their drawing courses a unit of instruction in reproducing shop drawings.

On November 1, 1921, a record parachute jump of 26,000 feet was made. — *Wisconsin Military District.*

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

SEASON'S GREETINGS

DECEMBER and January are the months in which INDUSTRIAL ARTS AND VOCATIONAL EDUCATION has always expressed its best wishes to its readers.

It may be said that world conditions have not improved to the point where we can look forward to much improvement in the conduct of its affairs. Human greed is still rampant. In its most dangerous forms it is apparent in some of the nations that at one time called themselves our allies, that received huge loans which ran into billions of dollars in cash, besides materials and food, to say nothing of the lives of American soldiers that our country had to sacrifice. Other nations and other peoples are still under the control of the communistic overlords of the Kremlin, but our allies who because of our help got protection and help, now seem quite willing to give help in money, food, and wartime tools, to Russia and to Russia's satellites.

But as history frequently has shown, those who have received favors from others, frequently forget to express gratitude. Russia and its satellites, for all America has done for them, go out of their way to cause more trouble for us.

Let us ask God's blessings upon all, whether friends or foes. May He make all of His creatures thankful for what He has done for them. May they become more appreciative of His blessings, may they become more charitable one to another, and may we all be spared the horrors of another war.

The last war has bankrupted some nations and has increased the cost of governing our country enormously. Our progress in discovering how to use the forces of nature has not brought us nearer to the Supreme Being who controls the forces of nature and gives man the intelligence to unlock these forces. Instead, man in his pride takes credit for the advances that he has made and tries to dominate the less gifted.

To improve conditions there must be a regeneration from within the individual. We must again come back to the realization that wealth and might do not necessarily make our actions right, and that the richest and the most influential are still subject to the Ten Commandments.

We must understand once more that we are not a law unto ourselves, and we must strive to return to the moral and spiritual insight of our ancestors.

May the 1957 Christmas and the 1958 new year be most joyous and happy, not only for us and our friends but for all the peoples of the earth. May peace and good will once more reign supreme.

SHOP VENTILATION DURING THE COLD MONTHS

IT IS at this time of the year that the shop teacher has to be extraordinarily careful to have the ventilation and temperature in his shop properly adjusted. In most of the newer school shops this phase of the teacher's duty is more or less automatically taken care of but even where this is the case, care must be taken that nothing unforeseen may happen.

With the many newer finishing solvents that are in use today, there always is the danger that some of them may contain toxic elements that may be detrimental to the health of those who are in a classroom which is so tightly closed up that not enough fresh air is admitted while the class is in session.

Read carefully the labels on cans in which paints and finishes are bought. Follow the recommendations of the manufacturer carefully. Some of these materials are highly flammable and or toxic and may cause fires and explosions.

At any rate, follow the instructions for using these materials carefully. Do not gamble with your own health or that of your students, or with the safety of your school building. Emphasize the necessity of practicing this carefulness when talking with your students, because they too use the materials at home that you find helpful in the school shop.

Have your students compete with each other in preparing a good set of rules for avoiding the dangers described in the foregoing. This may call their attention to enforcing the good practices in the school shop and in their home shops.

BENJAMIN FRANKLIN

THE earnest print shop teachers who look upon Franklin as their special patron usually will make it a point to have a program during the week of January 17 to commemorate his birthday and also to celebrate printing education week. But it should not be forgotten that he was more than a printer and publisher.

He began as a helper at the age of ten in his father's shop as a soap boiler. A few years later he was apprenticed to his half-brother as a printer. Trouble arose, however, between the two step brothers, and Benjamin ran away to Philadelphia where he secured work in a local print shop. In 1724 he was sent to England to buy some printing equipment. Shortly after returning to Philadelphia in 1726 he started a printing business of his own. In 1729 he bought the Pennsylvania Gazette and through it became known throughout the colonies.

He taught himself to read French, Spanish, Italian, and Latin, and was a leader in many civic undertakings. Besides that he studied and experimented with many scientific theories and facts. Yale, Harvard, and other institutions conferred degrees on him in recognition of his scientific discoveries.

He also invented the Franklin stove, the lightning rod, and other helpful aids to man.

His political activities were equally numerous and successful. He founded the first public library, initiated a postal service, a fire department, and a police system. He was appointed postmaster-general of the colonies. During the war he was sent to France and gained both sympathy and aid for us in our war with England.

He has the distinction of being the only man who signed four most important governmental papers of his times; the Declaration of Independence, the treaty of alliance with France, the Treaty of Paris, and the Constitution of the United States.

He also was the founder of the Academy and Charitable School of the Province of Pennsylvania, probably the best in the colonies. This school later on became the university of Pennsylvania.

No one wants to deprive the students of printing of their big patron, but every American boy and girl should become cognizant of the fact that Benjamin Franklin was an outstanding American, second to no one but George Washington, and that he belongs to us all, and that all of us should join in to do him, and his memory, honor.

Problems and Projects

WHITTLING PROJECT — NIGHT HERON

BEN HUNT

Hales Corners, Wis.

Although somewhat stylized, this night heron dozing among the green ivy leaves, looks as though it might wake up and take off at the slightest noise, and in spite of the fact that the coloring is quite different from the green leaves, one has to look twice before the bird is noticed.

Sawing out the silhouette block both ways saves a lot of time. The $\frac{3}{8}$-in. birch dowel is set into the head for a stronger beak.

Note that the section at *A* is almost round, running gradually to the shape indicated at *B*. Notice also the cross section of the beak.

The eyes are made as usual by pressing and turning a hollow nosed nail set into the wood. I like to put in the eyes last — after the rest of the bird is painted. After the eyes are painted, put a drop of clear cement over them to give them a shiny look.

Sand the body as smooth as possible using the same method as described in the article on the mourning dove, namely a sandpaper stick.

Now you are ready to paint with water color (poster color). Lay out the outlines of the dark green with a pencil. Moisten the wood and give the entire bird a coat of light grayish buff. Go easy on the buff.

Next paint the wings with a darker gray to which a little buff has been also added.

Then dark green is painted last, when the wood is quite dry. This green should be quite dark. Then paint the black streak on top of the head.

Paint beak black on top and dark gray underneath. The eyes are red rimmed with black pupils.

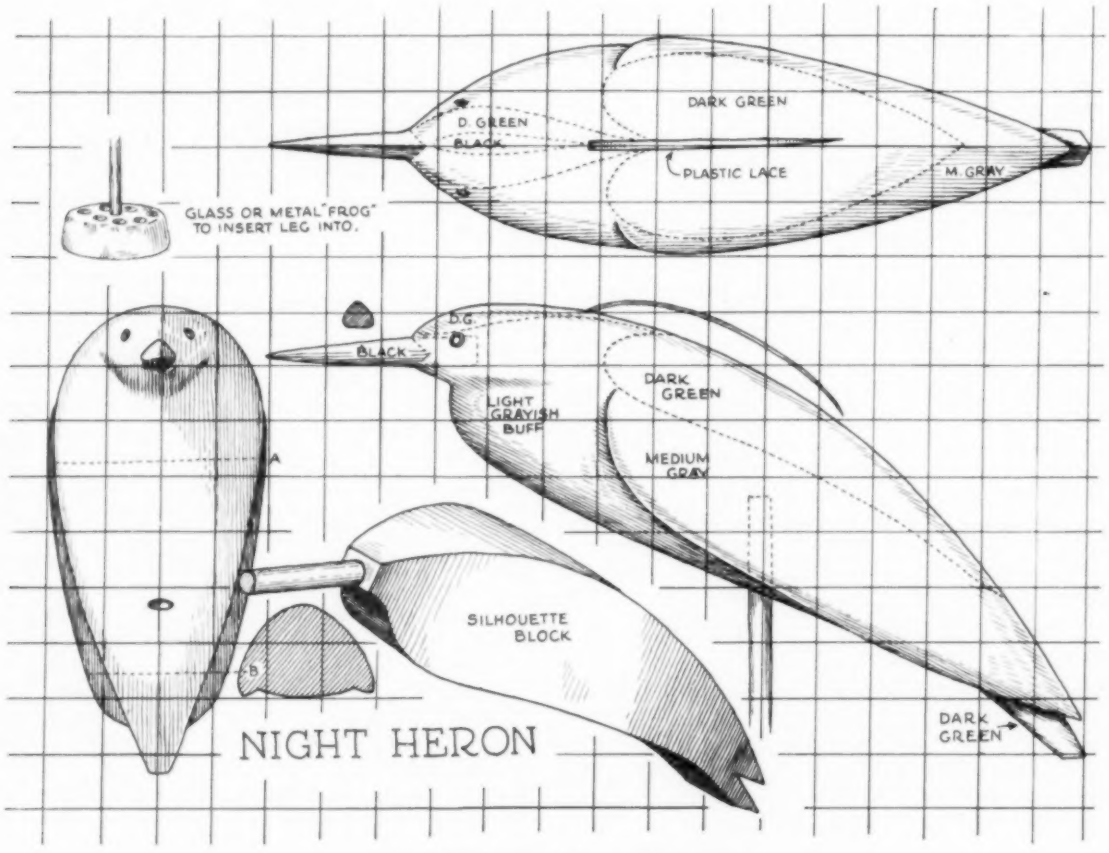
When dry, give it several light spray coats of clear plastic to prevent smudging when handled. Any clear can spray will do.

I am often asked why I use water colors rather than enamels or lacquers. In the first place, water colors are not so messy to use and the brushes are easier to clean. Water colors are less expensive than buying an assortment of oils or lacquers.

A dozen pairs of poster colors, including white and black, will allow you to paint a lot of small wood objects and you don't have to wait so long for them to dry.

For the finishing touch, taper a 3-in. piece of white plastic flat lace and insert it, using a drop of clear cement to set it into a slight groove made with the point of a small knife blade.

Since this bird was made to set into a glass or metal *frog* in a bowl of water, I used a $\frac{1}{4}$-in. yellow plastic rod for the one leg that the bird is resting on. A $\frac{1}{4}$-in. birch dowel painted yellow would also do



Detail drawing of the night heron

The finished project – the night heron

the trick. The length of the rod depends on the plant and the bowl. You may wish to set this heron in a spray or arrangement of cut flowers instead.

MODEL BUILDING – A LESSON IN CARE AND DILIGENCE

JACK BESSER

Chicago, Ill.

A teen-age boy puts the finishing touches on a complicated model airplane which has taken him 12 hours to build. His composite emotions rival an architect's pride when he enters a skyscraper he himself has designed.

Not only pride in the completion of a job is involved, but also the satisfaction of meeting and mastering a challenge with genuine creative effort.

To a shop teacher a hobby is an extra-curricular activity carried on outside of school hours, without any instruction whatsoever. This is generally true, but shop instructors should not overlook the fact that the lessons a boy learns in his model building moments are the very ones they try to teach in class. As a supplementary activity, model building can have real value in an over-all shop program.

Its value derives from its ability to: encourage constructive use of leisure time; provide for *controlled creativity* with progressively harder tasks; teach self-reliance and initiative; train pupils to follow written instructions; teach fundamental engineering principles; and stimulate curiosity in related fields, such as history.

Aware of the parallel between skillful hobbyists and apt shop pupils, many shop teachers today are recommending the model building hobby to their classes. Their endorsement sometimes goes so far as allowing extra credit for beautifully assembled models — even those put together from relatively simply packaged kits. Some teachers set aside one class session a week in which pupils can work on model building or similar hobbies and have expert instruction close at hand: this affords the student a contrast to regular class sessions.

While most of today's models are made of plastics, boys still enjoy building balsa models, which are still available.

Model building can be an individual hobby as well as a joint hobby

Instructors have found that their classes respond enthusiastically to this variation in routine. One reason advanced is the welcome emphasis on craftsmanship as an end in itself (teen-age boys rarely play with their models or put them to any use beyond displaying them in a recreation room). The regular emphasis of a shop curriculum, understandably, is on the practical. Parents and school boards would hardly be sympathetic if shop students didn't frequently bring home objects some member of the family could actually *use*.

A recent psychological study on the meaning of models in the life of American youth revealed they have enjoyed steady popularity because they prompt constructive use of leisure time. Young people and adults alike have more spare time today than ever before, but they still share the Puritan tradition that idleness is somehow sinful. A creative hobby like model building resolves this dilemma. Sales of model kits have zoomed since World War II, as have other materials for do-it-yourself activities.

The study, made by the University of Chicago psychologist, Peter E. Siegle, pointed out the social as well as psychological advantages of model building. When boys are at home, at a club, or even in school shop classes working on a hobby, their energies are devoted to making things rather than making trouble. Hobbies are notorious curbers of juvenile delinquency.

Siegle's study used the phrase *controlled creativity* to describe the essential value of building an authentic scale copy of an airplane, boat, or car. Since model kits are made to meet a wide range of skills, it is possible to be creative without being frustrated by a task that is too difficult. There are kits for kindergartners with half a dozen plastic pieces, and kits for the experienced hobbyist which have dozens of balsa wood parts and require plenty of time and patience. Most teen-age hobbyists begin with a kit combining plastic and balsa parts. Airplanes are by far the most popular model category. Siegle's study showed that older hobbyists like to build boats and cars as well.

Like any good shop project, the hobby of assembling models offers progression from simple to complex. It was learned that an individual's attention span can be lengthened by diligent devotion to a hobby; this is directly relevant to the need for *follow-through* in shop.

Since a good craftsman must be able to

work on his own as well as under instruction, an independent activity such as model building is a logical complement to skills mastered in class. The study also showed that self-reliance and growth of individual initiative are valuable by-products of work with models. Pupils are trained in following written instructions.

Although simple kits are available that require only fledgling skills, the more complicated models require painstaking effort in assembly and finishing. Concentration and a degree of manual dexterity are *musts*. Yet even the most difficult kits involve no special tools or elaborate work area; a table top and a tube of special glue are enough.

The forerunner of the modern packaged model kit was the elaborate ship assembled in a bottle. Both these activities answer a basic masculine need for vicarious adventure. Just as the retired sea captain reminisced while he built his tiny whaling vessel from toothpicks and wood scraps, so does today's adolescent dream of flying a jet plane or piloting a submarine.

This craving for adventure stimulates many a teen-ager to take up the model building hobby, and it often spurs curiosity in the fields of engineering and history. A boy who has constructed an authentic miniature of a rocket plane has gone a long way toward understanding the principles behind the original. Historical curiosity is stimulated when he works on one of the commemorative models, such as Admiral Byrd's "Tin Goose" (the Ford Tri-Motor).

An indication of the therapeutic value of the hobby is its extensive use in hospitals, rehabilitation centers, corrective schools and camps. Here the factor of *controlled creativity* is particularly important; the models chosen must fit the subject's degree of skill without posing an impossible challenge.

An adolescent boy isn't aware of what model building does for him — he simply knows it's fun. But you, as a shop instructor, will know. And you'll reap the benefits in better performance from your students.

PLUMB BOB

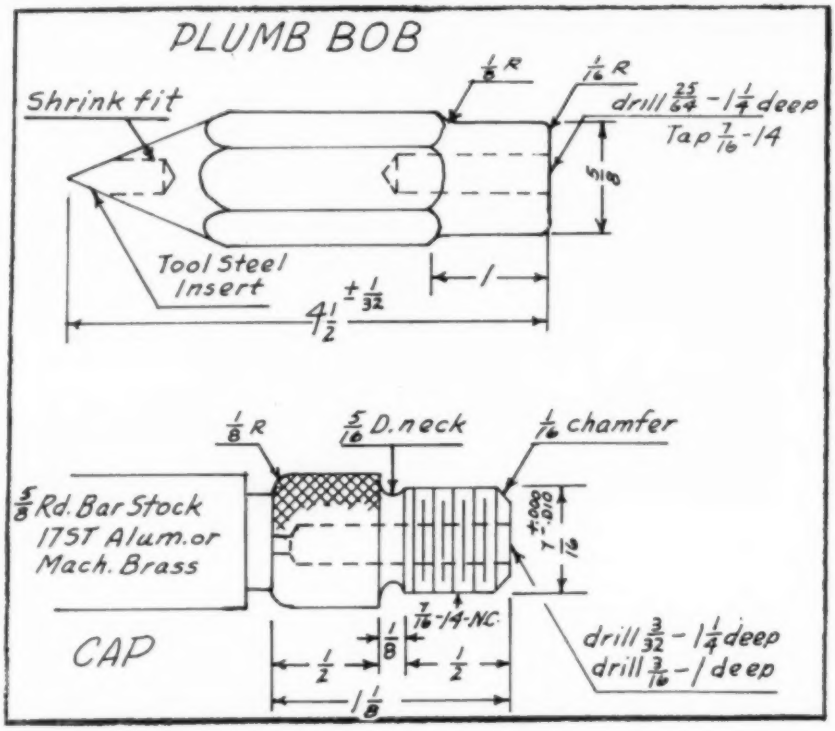
JULES BERTIN

North Allegheny Joint High School

Pittsburgh, Pa.

The writer knows that there is nothing unusual about a plumb bob. However, this one is different in that it involves four operations not generally found on a school shop plumb bob. The four operations are:

1. Shrink fit of tool steel insert for point.
2. Tapping on lathe.
3. Lathe grinding a tapered finish.
4. Chasing threads on lathe.



Details of the plumb bob

Bill of Materials

Body:

One piece cold drawn hexagonal mild steel 1 by $4^{9}/_{16}$ in.

One piece of $^{3}/_{16}$-in. drill rod or H.C. tool steel. End of this stock to be turned to .253 by 1 in.

Cap:

One piece round bar stock $^{5}/_{8}$ in. — 17ST aluminum or machinery brass. All work on the cap will be done on the end of bar then cut off.

Body

1. Face off one end of the hexagonal steel.
2. Measure to length and face off other end. Note tolerance.
3. Drill one end 1¼ in. deep, using a drill. Ream to ¼ in.
4. Turn a piece of drill rod or tool steel to .253 in. Cut off and grind slight chamfer on one end.
5. Heat the drilled end of the hexagonal bar until it is red hot. Lock it in the vise, hole end up. Hold the .253 in. by 1-in. tool steel rod with pliers (chamfer end down). Set this pin in hole and drive into hole until flush with faced end of hex bar. Place in lime to cool. Lime will anneal the tool steel for turning.
6. After the stock is cool, chuck it up in the lathe. Turn down the plugged end to taper point according to specifications.
7. Heat the tapered end to cherry red, and then plunge it into oil to harden the point.
8. Set up the lathe grinder, and grind finish the tapered end.
9. Turn the cap end according to specifications.
10. Center drill and drill $^{25}/_{64}$ in., 1¼ in. deep.
11. Set up $^{7}/_{16}$ by 14 tap on tail center of lathe. Tap the hole. Do not use power.
12. Finish all surfaces with abrasives. Flame-blue the body of plumb bob, if desired.

Cap

NOTE: For ease in working, the cap of the plumb bob should be made completely on the end of a long (not exceeding 16 in.) piece of $^{5}/_{8}$-in. diameter rod. Cap is to be cut off upon completion.

1. Face off end of $^{5}/_{8}$-in. rod. Measure length 1⅛ in. Cut a neck at this point where cap will be cut off later.
2. Turn $^{5}/_{8}$-in. length of this stock to $^{5}/_{16}$-in. diameter as specified. Note tolerance.
3. Cut concave neck as specified. Use cutoff tool ground to half round point.
4. Cut the $^{1}/_{16}$-in. chamfer on end as specified.

NOTE: *Do not* begin step 5, unless there is ample time to complete the operation of chasing the thread. It is unwise to remove from lathe a partially completed threading operation.

5. Chase $^{7}/_{16}$-in. — 14 thread. Fit this

thread to internal thread of the body of the plumb bob. This should be a free-fitting job.

6. Center drill and drill $^{3}/_{32}$-in. hole, 1¼ in. deep. Use extreme care in drilling this small diameter hole.

7. Enlarge this hole with $^{3}/_{16}$-in. drill, 1 in. deep.

8. Knurl as shown on drawing. Use available knurl.

9. Use cutoff tool to cut cap from the end of rod.

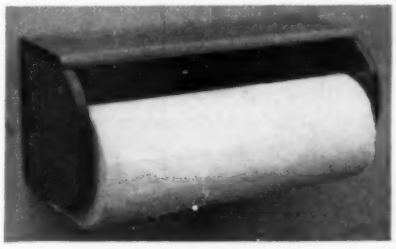
10. Wrap one layer of soft metal around knurled portion of cap. Chuck in lathe with knurled end projecting about ¼ in. Face this end, cutting off as little as possible. Clean up the ⅛-in. radius corner.

PAPER TOWEL RACK

JOSEPH LUPKIN
Industrial Arts Instructor
Port Chester Junior High School
Port Chester, N. Y.

Objectives

1. To teach how to recognize different types of wood.
2. To teach how to square stock by hand.
3. To teach how to use basic hand tools.
   a) Plane
   b) Saws — coping, crosscut, rip
   c) File
   d) Auger bit and brace
   e) Tri square
   f) Nail set
   g) Hammer
4. To teach finishing operations.
   a) Sanding
   b) Staining
   c) Nailing
   d) Gluing
   e) Shellacking
   f) Waxing
5. To teach appreciation for good workmanship.



Paper towel rack

Materials Required

1. Wood — back ⅜ x 5½ x 12½ in.
   sides ⅜ x 5½ x 5⅛ in.
   top ⅜ x 4 x 12½ in.
   dowel ½ x 12¼ in.
2. Brads — 12 No. 18 x 1¼ in.
3. Glue — good grade of wood glue
4. Sandpaper — No. 1/2 and 3/0
5. Stain and brush
6. Clear shellac and brush
7. Water putty
8. Cotton waste

Procedure

1. Cut all stock, except dowel rod, ¼ in. oversize.
2. Plane and square stock.
3. File curves on side pieces and on top front piece.
4. Bore holes in sides for dowel rod.
5. Glue and nail parts.
6. Set nails.
7. Apply water putty to nail holes.
8. Start finishing operations — sand, stain, shellac, wax.

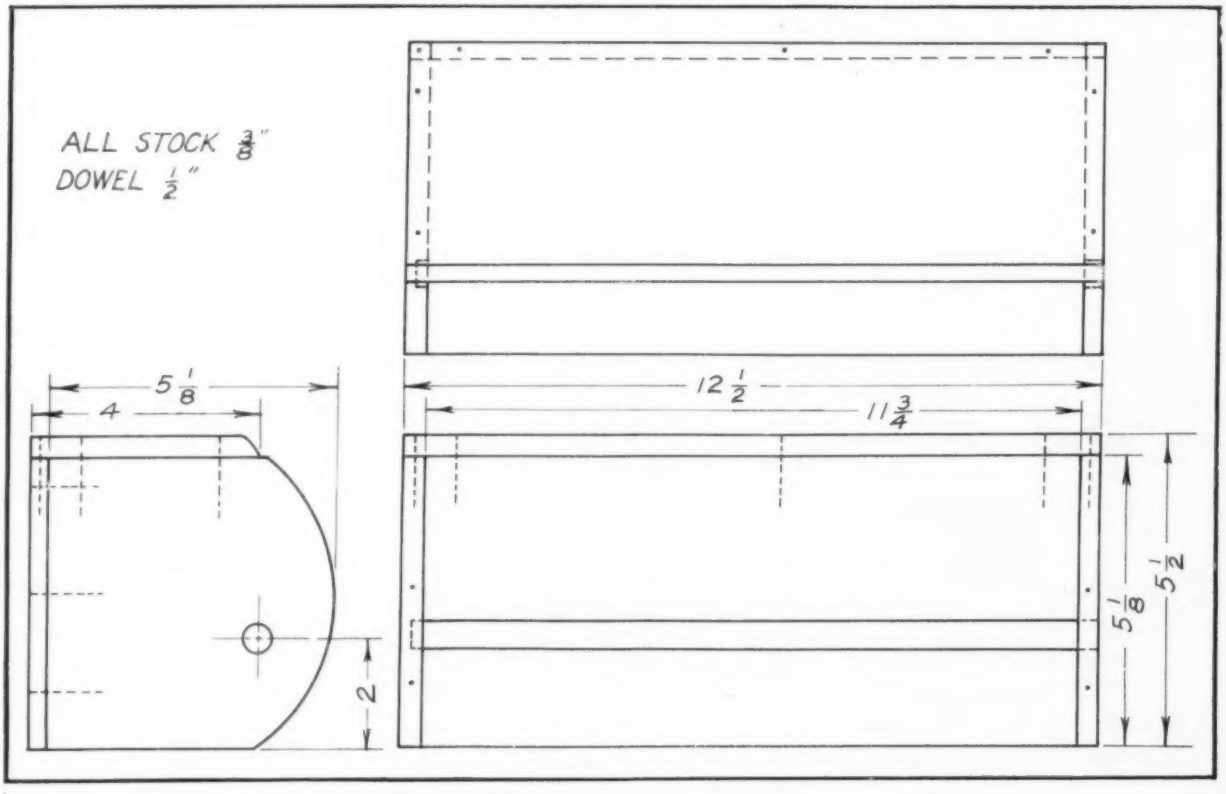
LEAF LAMP

UNO SUOMELA
High School
Charlevoix, Mich.

To make the lamp shown herewith the following materials and tools are required.

Bill of Materials

No. of Pcs.	*Part*	*Material*	*Size*
3	Leaves	Gal. iron	1½ x 9 in.
1	Base	Gal. iron	4½ x 4½ in.
1	Post	Pipe	⅛ in. rd. x 5½ in. long
1	Shade	Wire	No. 14 x 36 in. long
1	Socket		
1	Plug		
1	Lamp cord		



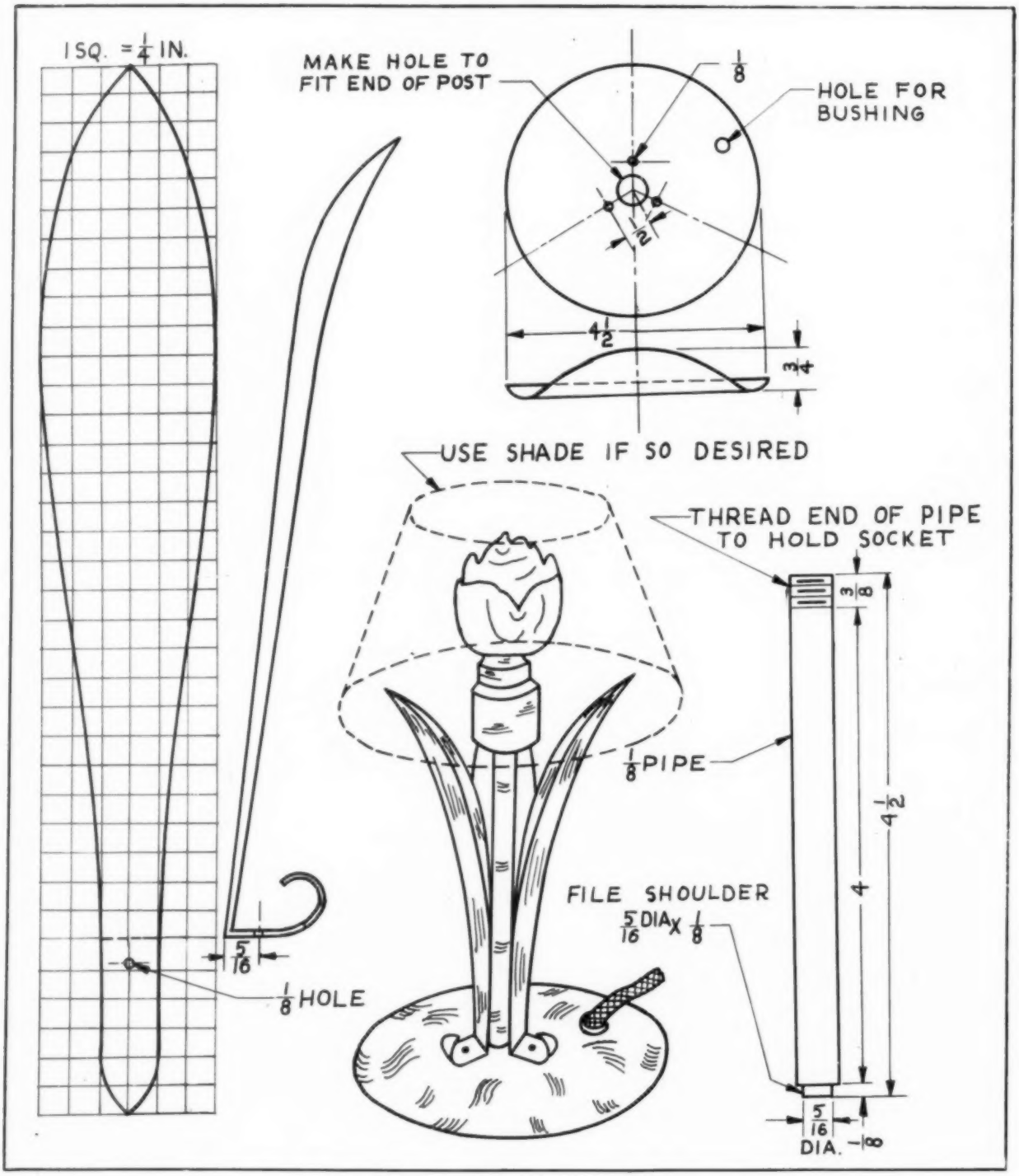
Details of the paper towel rack

Tools

Raising hammer, tin snips, soldering equipment, file, hand drill, and ball-peen hammer.

Procedure

1. Lay out and cut out base and three leaves.
2. File edges smooth.
3. Use raising hammer to shape parts.
4. Locate and drill all holes.
5. Cut a piece of pipe for the post.
6. File the shoulder on one end to fit the hole in the base.
7. Thread the other end of the pipe using ⅛-in. pipe die.
8. Place the pipe into the hole in the base and upset with ball-peen hammer.
9. Rivet and solder the leaves in place.
10. Attach the socket to the post. Shade optional.



Details of constructing the leaf lamp

11. Make frame for the shade from wire.
12. Cover with heavy paper.
13. Finish all parts with enamel.
14. Wire up the cord and plug.

CORNER SHELF

M. L. Zanco

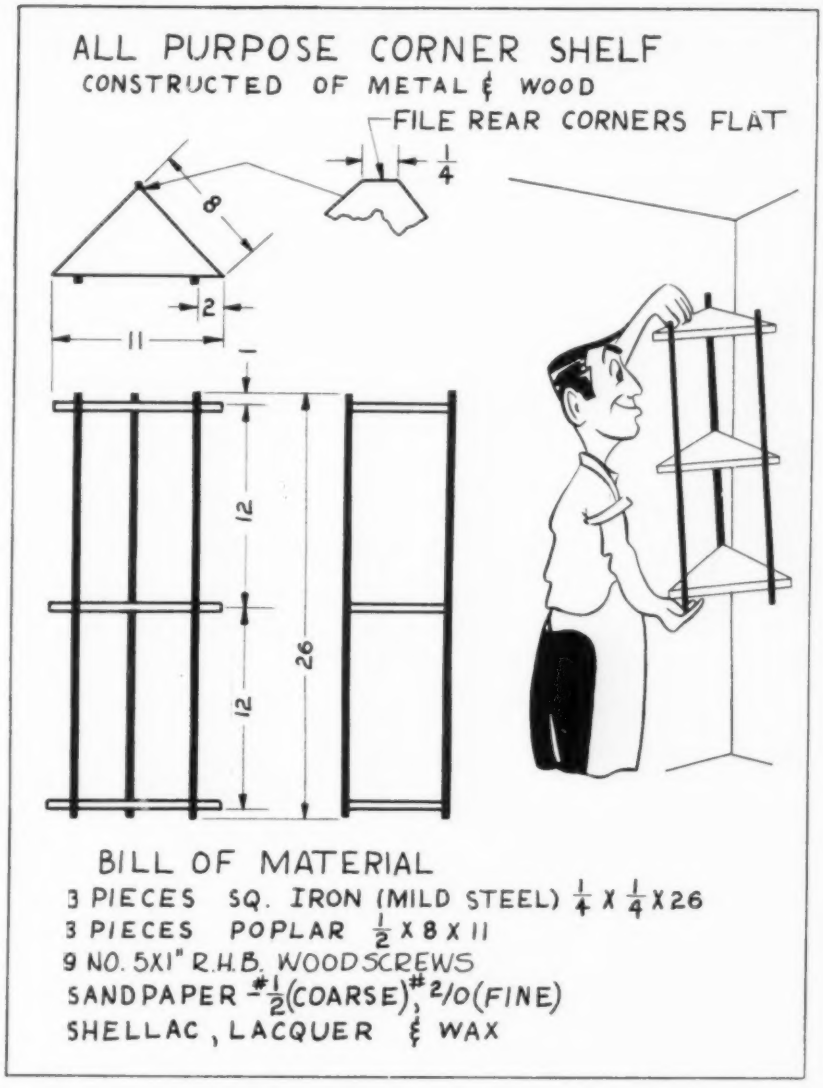
Waukegan, Ill.

Tools and Equipment

Crosscut saw; jack plane; pencil and try square; ½ garnet coarse and 3/0 aluminum oxide fine; hack saw; metal file; awl, try square and punch; drill press; metal file; rag and benzine; brush and lacquer.

Steps in Making the Project

1. Cut ½-in. poplar to size.
2. Plane all surfaces and edges.
3. Lay out holes in lumber.
4. Sand all surfaces and edges.
5. Cut ¼-in. square metal to size.
6. Bevel all ends of metal.
7. Lay out holes.
8. Drill (⅛-in. diameter) holes.
9. File off burrs around the holes.
10. Clean metal.
11. Dip or brush metal with metal lacquer.
12. Allow 30 minutes to dry.
13. Apply finish to poplar.
    a) Use shellac as a base (dry for two hours).
    b) Rub down with fine steel wool and dust.
    c) Brush on clear gloss varnish.
    d) Rub down lightly with steel wool.
    e) Wax.
14. Assemble.



Detail drawing of the corner shelf

NINTH GRADER WINS SWEEPSTAKE PRIZE

DR. T. FLEMING

Stout State College

Menomonie, Wis.

Shown here with the round glass-topped mahogany coffee table with which a ninth-grade boy won the sweepstake competition among individual exhibits in the industrial-arts division of the Minnesota State Fair are, left to right, Milo J. Peterson, superintendent of the fair's education department; Raymond L. Cornwell, Stout State College Faculty member who was a judge; and Dale Davidson, assistant superintendent for the industrial arts subdivision of the fair.

The winning project

The education department of the fair offered a total of more than $10,000 in premiums for all divisions combined.

The industrial-arts division was subdivided into five classes for various grade levels seven through twelve. Each class, in turn, offered competition for projects in wood, metals, graphic arts, crafts, electricity, and drawing.

In all, 120 awards were made, ranging from the five dollar blue ribbon first place to a yellow ribbon for fifth prize. A sweepstake prize of $20 and a special ribbon were given to the outstanding entry in all categories.

Following the judging of the entries, all were placed on display in the education building at the fairgrounds.

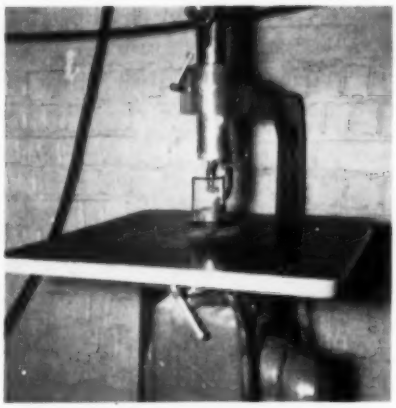
Washington delivered his farewell address to his officers at Fraunce's Tavern, New York City, on December 4, 1783. — *Wisconsin Military District.*

Know what makes up sealing wax? It contains shellac, rosin, and coloring matter. — *Shellac Information Bureau.*

PLEXIGLAS BAND SAW AND JIG SAW GUARDS

JOHN C. McCrory
Industrial Arts Department
Penn High School
Greenville, Pa.

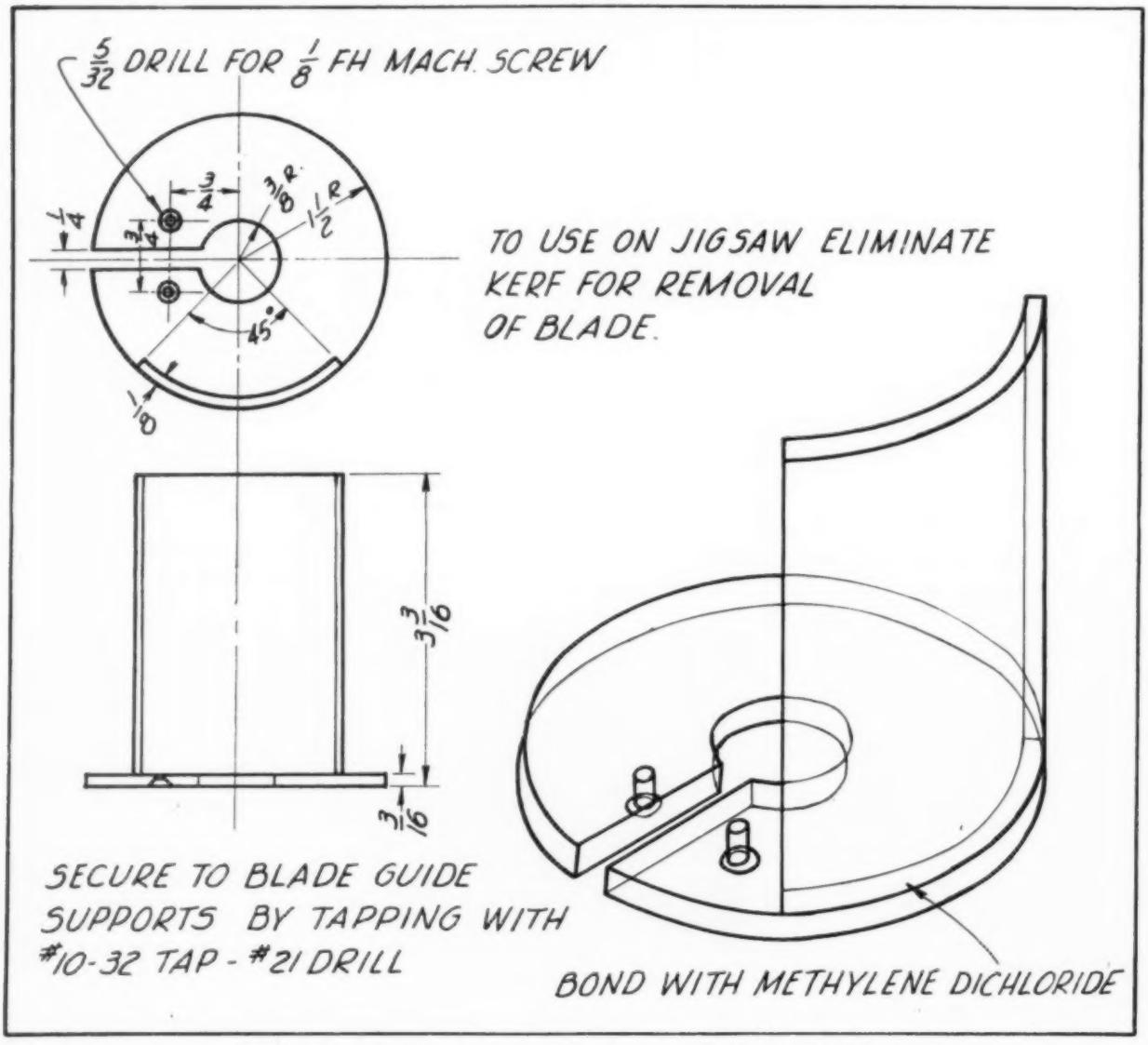
With the use of the plastic saw guards shown herewith, the accidents on the band saw and jig saw will almost be eliminated. Unless the operator places his hand directly behind the guard, it is impossible to come in contact with the blade. The guard is adjustable if mounted on the hold-down of saws and should be brought down to within ⅛ in. of the wood being sawed. Since the guard is clear plastic one can look through without any obstructions or distortions. Any sawdust that may want to collect on the base of the guard is removed by the wind created by the blade speed.



Plexiglas guard for band saw or jig saw

The edges of the guards should be painted red to outline the clear guards. Scratches can be removed by buffing with jewelers' rouge. This is sometimes necessary when a blade breaks on the band saw or comes off the track or when using a saber blade that loosens on the jig saw.

It is not necessary to remove the guard when installing a new blade on the band saw. A slot is provided on one side to allow the blade to be brought out. On the jig saw it is not necessary to have the slot for removal of the blade as the blade can be put down through the hole in the center.



Details of the plexiglas jig saw and band saw guard by John C. McCrory

EVALUATING STUDENT PROJECTS

MORRIS ALPERVITZ
Parcells Junior High School
Grosse Pointe Woods, Mich.

One of the problems that confronts the industrial-arts teacher in woodwork is that of evaluating projects. Various methods of grading have been used in our department, and at best it has seemed to be a hit and miss proposition. Generally, it has left the student and the instructor dissatisfied.

This past year, however, a more objective approach to grading was worked out. Using the accompanying work sheet, the good student and instructor now work out an approximate time for the completion of the project at its inception. The time element is based on the skills of the student as known by the instructor, and the difficulty of the project. The estimated time is then recorded in the upper section of the box under the column marked Started, and the actual time of starting in the lower section. The actual time of completion is recorded under the heading Finished. Full value for promptness in completing a project is scored at ten points. For each day the project is late, one point is deducted from this total to a maximum of ten points.

Point values on the other phases to be marked may vary with the instructor, but the following point values used in our shop have proved satisfactory: *Difficulty of Project* — 25 points; *Time Allowance* — 10 points; *Workmanship* — 25 points; *Design* — 10 points; *Sanding* — 10 points; *Assembly* — 10 points; *Finish* — 10 points. The points awarded on these separate phases are then added to determine a total score for the project. Ninety to one hundred points is scored as *A*; 80 to 89 points *B*; 70 to 79 points *C*; and 60 to 69 points *D*.

Name	Project	Started	Finished	Cost	Difficulty of Project	Time Allowance	Workmanship	Design	Sanding	Assembly	Finish	Grade

Work sheet used in evaluating student projects

WELDING CART

VERNON B. LUCAS
Junior High School
Portsmouth, N. H.

The welding cart pictured here was made almost entirely from scrap pipe. It was designed to hold and transport easily all the equipment and materials necessary for gas welding and cutting.

Carts of this type may be purchased from many welding supply houses but are not always completely satisfactory and their cost is often prohibitive to the person working on a limited budget.

The only parts not made of scrap are the wheels, steel floor plate, axle rod, and plywood tool panels.

Dimensions have been omitted as instructors building this will want to adapt it to fit their own needs.

Several views of the welding cart

WE MADE OUR OWN PLASTIC FORMING PRESS

LAUTON EDWARDS*
Knoxville, Tenn.

We, in the plastic shop at Park Junior High School, Knoxville, Tenn., made our own plastic forming press with the help of the machine shop of Fulton School.

*Author of "Making Things of Plastic."

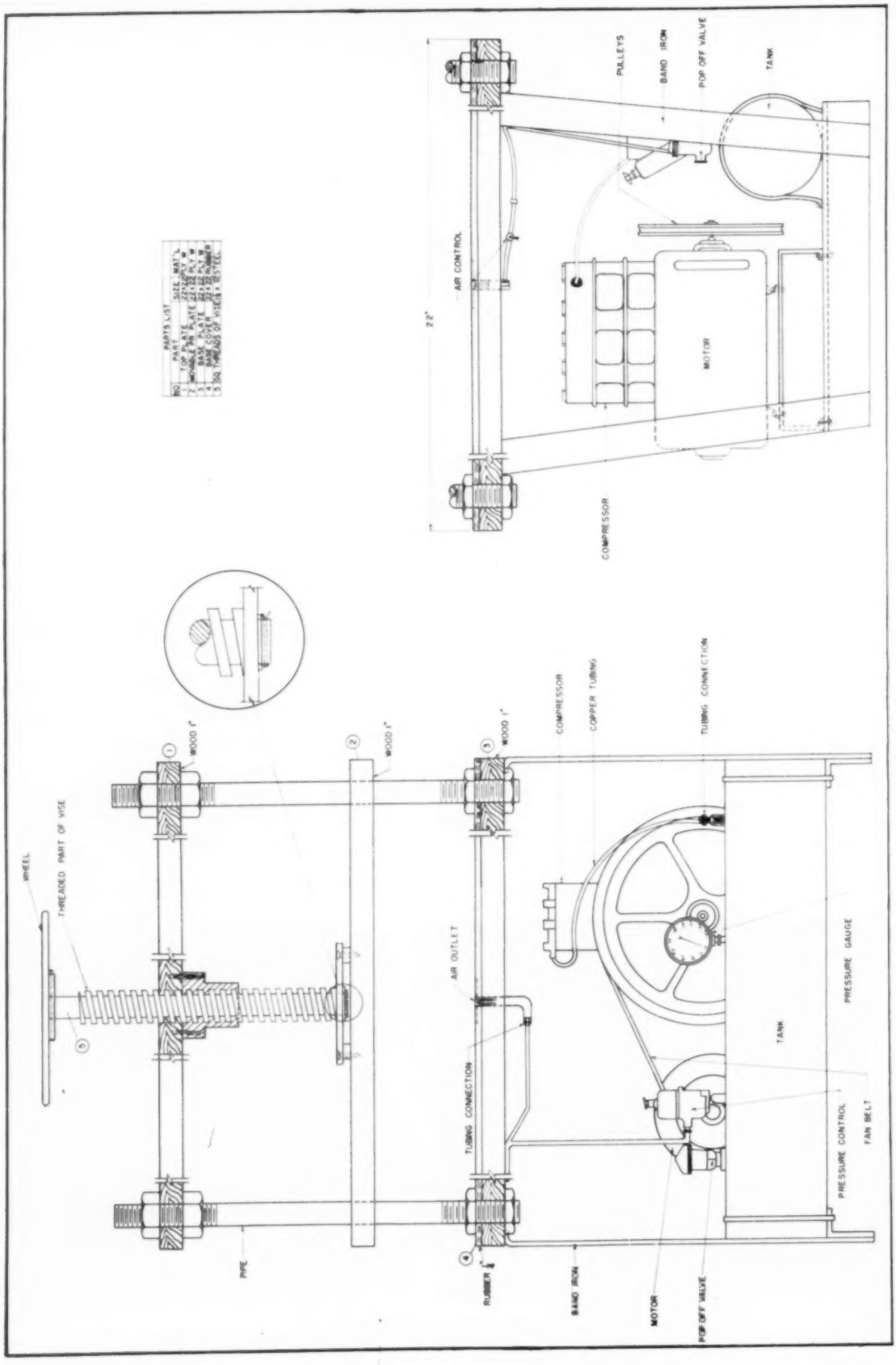


Fig. 1. Details of the plastic forming press

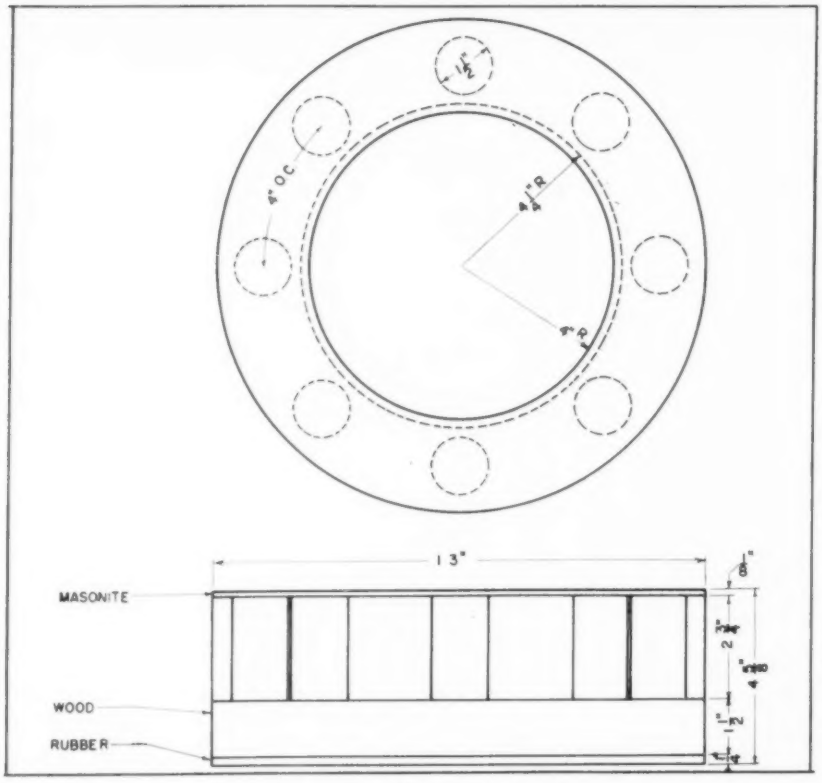


Fig. 2. Mold for punch bowl

The following materials were used:

An air compressor and tank with 120 psi capacity was mounted on a platform with a piece of plywood 1 by 22 by 22 in., mounted on top. To this compressor was attached a ¼ h.p. motor. The tank has a gauge with pressure of 150 pounds, with the pop-off valve set at 90 pounds. This pressure control insures against explosion of the tank. Tubing is run from the compressor to the tank and from the tank to the edge of the plywood (Figure 1).[1] There a control valve is placed to turn the air on and off and to control its flow. Then the tubing is run from the edge of the plywood to the center and up through the center. The top of the plywood is covered with a ½ in., crepe rubber seal or gasket.

The upper part of the press was made as follows:

One-inch holes were drilled in the corners of the rubber and plywood for pipes of one inch outside diameter to go through. Four pieces of pipe 18 in. long, cut and threaded on both ends, were fastened in these holes, with a check nut on the underside of the plywood and one on the top of the rubber. It is important to set these pipes at right angles to the plywood so as to permit easy operation of the press. Then another piece of plywood 1 by 22 by 22 in., was cut and holes drilled in the corners to fit loosely over the upright pipes. A third piece of plywood 1 by 22 by 22 in. was cut with holes in the corners for the pipes, which were made stationary to this top piece of plywood with check nuts above and below. A bench screw from an old vise was fitted so as to run down the center of the third, or top, piece of plywood with the bottom of the screw fitted to the loose-fitting, movable, piece of plywood. See Figure 1. A wooden wheel was made and fastened on the upper end of the bench screw. With this attachment the center, or movable, piece of plywood can be moved up and down by turning the wheel. The top of the third, or upper, piece of plywood was reinforced with metal bars. (NOTE: It would be better to make the top part of ½-in. metal instead of plywood.) This completes the description of the press.

Now a general discussion of molds to be used with the press. Molds may be made of various shapes and sizes, to achieve desired purposes. However, all should follow the same principle, which is as follows: For example, in making a mold for bowls[2] of particular dimensions, cut a disk 16 in. in diameter. Then cut out a center piece 13½ in. in diameter. The remaining ring 2½ in. wide is the part used in making the mold. Then cut out a disk of ½ in. crepe rubber 16 in. in diameter, and cut out of this a center piece 12 in. in diameter. The ring so made was beveled down on the inside circumference on a sander, and glued to the wooden ring.

Eight dowels 1½ by 3 in. were fastened upright on the plywood ring. Then a piece of Masonite was fastened on the top of the dowels with the smooth side down.

Using the machine:

The plastic used must be at least an inch larger than the mold due to the stretching of the plastic when the air is applied. Although we have described a mold of specific dimensions, the thickness to be used is determined by the mold to be used. The greater the depth desired, or the greater the stretch, the thicker the material used. Using the mold described above, material 3/16 or ¼ in. thick should be used.

The plastic is heated at 350 deg. F., until it is flexible. Before removing plastic from the oven the mold should be made ready and the air pressure built up to approximately 45 psi. The hot plastic is then placed down, centering on the air outlet. The mold is then quickly placed on top of the plastic and tightened down by use of the press wheel. The air is then turned on and the plastic watched carefully so as not to blow more than desired. The air flow is controlled by use of the air-control lever.

After three to five minutes, depending upon the thickness of the material, the air pressure is cut off and the plastic taken out of the mold. The excess plastic is then cut off with the band saw.

Some of the molds that we have made are for punch bowls, salad bowls, planters, measure dippers, heart-shaped boxes, lazy susans, salad plates, etc. Our work with this machine has just begun. We expect to do much more with it next year. One of the many values of this machine is that with it misshapen and scrap plastic can be used as well as unused flat plastic with the masking paper on it. Regardless of the shape of the plastic material used, as long as it has no scratches on it, it is as good as new material for use with this machine.

(See Figures 3 and 4 on next page)

Every minute of *today*, about 105,000 gallons of gasoline are being used in the nation's vehicles, planes, tractors, boats, and industrial engines. — *Petroleum Newsnotes.*

On October 11, 1853, the course of study at the United States Military Academy was reduced from 5 to 4 years. — *Wisconsin Military District.*

[1]Drawings for Figures 1 and 2 by Larry Hunley and Gene Holt, under the direction of Harold Worth, Fulton High School, Knoxville, Tenn.

[2]Photographs (Figures 3 and 4) by Robert Gammon, Fulton High School, Knoxville, Tenn.

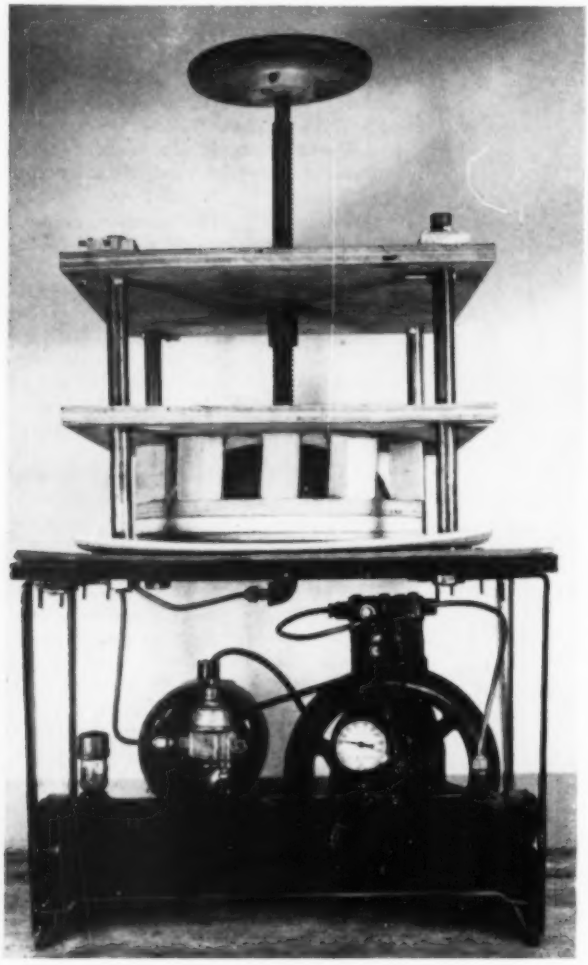


Fig. 3. The plastic forming press

(See article on pages 25, 26, and 27)

Fig. 4. Bowls made on the forming press

KOREANS STUDY METHODS AT STOUT STATE COLLEGE

Korean educators of the Korean Ministry of Education recently visited Stout State College to study the curriculum and instructional procedures used here. Their visit was sponsored by the International Co-operation Administration, in co-operation with the U. S. Office of Education.

The aim of the Koreans' examination of the Stout educational process was to prepare themselves to develop practical training facilities and to improve teaching practices and administration of Korean secondary schools.

Upon their return to Korea, the visiting educators will help inaugurate an instructor training course in a large Korean technical high school and will assist the Korean Ministry of Education in revising subject matter and instructional methods.

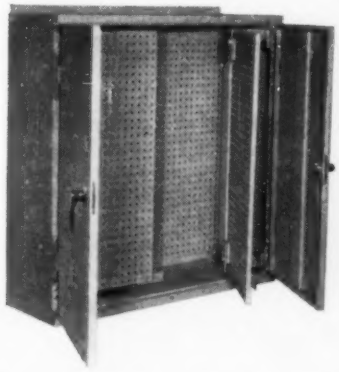
Workshops and summer courses in trade and industry shop subjects are also planned for teachers in Korea. The visitors to Stout met with Dr. Verne C. Fryklund, president of the college, and Dr. John A. Jarvis, dean of the division of industrial education. The Koreans then went into Stout classrooms, shops, and laboratories.

In the visiting group were Byung Ho Kim, of the educational administration of Kyung Nam provincial government, Pusan; Man Ho Kim, of Tong Do technical high school, Seoul; I Kwan Lee, principal of Seoul technical high school; Joon Hyeng Lee, secondary supervisor of Kyungbuk province; Chang Soo Aoh, architectural engineer for the Korean Ministry of Education; and Moo Deck Rim, also a technical high school principal.

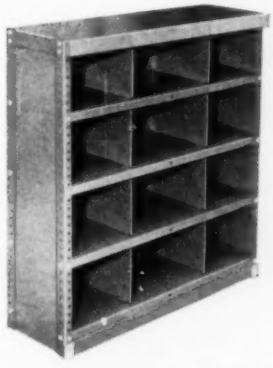
Accompanying the group were Eugene Flug, instructor in the department of industrial education at the University of Minnesota, on whose campus the tour party spent much time, and Manabu Fukuda, interpreter for the U. S. Department of State.

Dr. Verne C. Fryklund demonstrates a circular saw. He is president of Stout State College, Menomonie, Wis., and he is watched by (left to right): Manabu Fukuda, interpreter for the U. S. Department of State; In Kwan Lee, principal of Seoul, Korea, technical high school; Dr. John A. Jarvis, dean of Stout's division of industrial education; and Joon Hyeng Lee, supervisor of secondary schools in Kyungbuk Province, Korea. The Koreans and their interpreter were part of a larger group of Korean educators recently visting the Stout campus

Vertical Lumber and Metal Storage Rack. Holds 12 to 14 ft. lengths of lumber, pipe, bar stock or conduit in the vertical compartments. Three shelves are provided for shorts. Base shelf is 24 in. deep, intermediate shelf 18 in., and top shelf 12 in. Triangular unit is 4 ft. wide, 34 in. deep at base. Rectangular plywood storage unit is 24 in. deep, holds sheets on 4 ft. edge.



Tool Storage Cabinets. Wall and floor types, with all-steel pegboards. Wall type has pegboard area of approximately 24 sq. ft., floor type approximately 65 sq. ft.

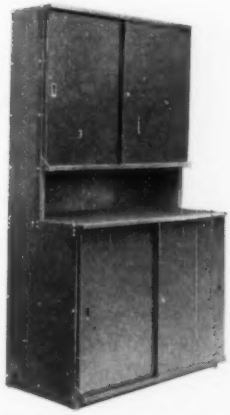


Apron and Book Racks. Provides space for aprons, books, etc., of 12 students. Each compartment is 12 in. deep, 12 in. wide, 9 in. high.

All the storage units you need in HALLOWELL School Shop Furniture

Need racks for storing current supplies of lumber, pipe, bar stock, conduit? Or steel pegboard cabinets for safely storing tools? Or cabinets for holding student projects? Or wardrobe cabinets for apparel? We make standard units of HALLOWELL School Shop Furniture for all these storage requirements. And they cost much less than custom-designed equipment.

Write for Bulletin 2246 today. It gives detailed information about the complete line of functional HALLOWELL units for outfitting industrial arts and vocational shops. Hallowell Shop Equipment Division, STANDARD PRESSED STEEL CO., Jenkintown 74, Pa.



Stain and Finish Cabinets. All-steel for safe storage of flammable materials. The base has one adjustable shelf, the upper cabinet two. Both base and upper cabinet are equipped with smooth-operating sliding doors.

STANDARD PRESSED STEEL CO.

HALLOWELL SHOP EQUIPMENT DIVISION SPS

JENKINTOWN PENNSYLVANIA

PERSONAL NEWS

(Continued from page 4A)

DR. BROWN AT NORTHERN ILLINOIS UNIVERSITY

Dr. Robert D. Brown has joined the faculty of Northern Illinois University, DeKalb, Ill., as assistant professor of industrial arts. Prior to this assignment he taught industrial arts at Washington Junior High School, Glendive, Mont.; the University of Minnesota; Long Beach State College; and, during the 1956 summer session, at Utah State Agricultural College, Logan, Utah.

He holds memberships in Phi Delta Kappa, Epsilon Pi Tau, the American Industrial Arts Association, the Illinois Industrial Arts Association, the Illinois Vocational Association, and is listed in Who's Who in American Education. He holds the B.S., M.A., and Ph.D. degrees granted by the University of Minnesota.

Dr. Brown's work at Northern Illinois University includes the teaching of beginning and advanced drawing and professional industrial-arts courses at the graduate level and the advising of a group of undergraduate and graduate students.

PHILIP YOUNG IS HONORED

At the Industrial Arts Association of Pennsylvania Convention, Epsilon Pi Tau breakfast, held October 26, 1957, at Hershey, Pa., J. Philip Young, director of industrial arts, Neville Township High School, Neville Island, Pa., was presented with the Laureate Citation of Epsilon Pi Tau, Inc., the International Honorary Professional Fraternity in Industrial Arts and Industrial Vocational Education.

The citation reads:

"For his leadership in behalf of young men in the profession, for promoting effective county industrial arts teacher organizations in Pennsylvania, for organizing a strong State Industrial Arts Teacher Association and for his abiding interest in Psi Chapter of Epsilon Pi Tau."

Dr. Merrill G. Campbell, trustee of Psi Chapter, made the presentation after Mr. Young had described to the members and guests the historical origin and growth of the Industrial Arts Association of Pennsylvania.

Dr. Wm. E. Warner, executive secretary of Epsilon Pi Tau, described in detail the vast scope of overseas technical education projects and programs. A considerable number of E.P.T. members have, are, and will be serving these governmental or private agencies in many countries, such as Brazil, Indonesia, Iran, Nicaragua, Pakistan, Thailand, Uganda, and others.

Nowhere Else
FINER PLANES TO CHOOSE FROM

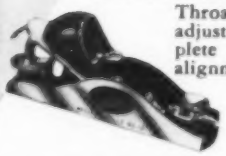
No matter what the need, there's a Millers Falls Plane to meet it. And all of them have that perfection of feel and balance that makes it easy for students to do their best. Equally important, their superior quality also assures the longer-lasting, dependable service that is the only true economy. See them at your suppliers.

No. 9 SMOOTH PLANE
For finishing large surfaces. Improved grip gives more hand room — and better balance.

No. 14 JACK PLANE
For edging and all 'round use. Quick, easy depth and side adjustments of the tool-steel iron.

No. 22 JOINTER PLANE
For utmost accuracy — particularly on long boards, and fine cabinet work.

No. 16 BLOCK PLANE
Throat, depth and side adjustments provide complete control of cut and alignment.



Send for your FREE copy of Catalog No. 49 — 120 pages of fine hand tools; also DYNO-MITE Power Tool Catalog. Please address Dept. IA-32.

No. 75 BLOCK PLANE
Moderately priced quality plane. Has screw depth adjustment. An outstanding value.

Millers Falls

MILLERS FALLS TOOLS SINCE 1868

MILLERS FALLS COMPANY
Greenfield, Mass.

ECKHART A. JACOBSEN RECEIVES DOCTORAL DEGREE

Eckhart A. Jacobsen was awarded the doctor of philosophy degree in industrial education by the University of Connecticut at commencement exercises held June 9, 1957. Dr. Jacobsen has the distinction of being the first candidate at that institution to be granted the degree in this field, new to the University since 1954. The title of his dissertation is "A Comparison of Competitive and Co-operative Learning Experiences in Technical Drawing on the College Level." His major advisor was John W. Karnes, Jr.

Dr. Jacobsen did his undergraduate work at the State College for Teachers, Oswego, N. Y. He attended New York University and received his master of science degree from Cornell University in 1946.

His experience in industry has been considerable and varied. His teaching experience has included work at the elementary, junior high, and high school levels distributed among several school systems in the state of New York. From 1944–46 he was City Supervisor of Industrial Arts at Elmira, N. Y. From 1946 until recently he was on the staff of the State Teachers College, Fitchburg, Mass. Effective at the beginning of the fall semester, 1957, he became Associate Professor of Industrial Education at the University of Maryland.

Dr. Jacobsen is or has been a member of schoolmasters and industrial education societies of New York State, American Industrial Arts Association, American Vocational Association, New England Industrial Arts Teachers Association, Massachusetts Industrial Education Society, American Association of University Professors, National Education Association, Phi Delta Kappa, and Epsilon Pi Tau.

INDUSTRIAL ARTS TEACHERS MOVE INTO ADMINISTRATION

Four of Houston's industrial arts teachers are now in the field of school administration in the following positions:

Joe B. Brooks, a former mechanical drawing teacher at Burbank Junior High School, is now principal of the De Zavalla Elementary School, Houston, Tex.

Bill Madeley, formerly a teacher in the metal shop at Burbank Junior High School, is now assistant principal of the new Frank M. Black Junior High School.

Kenneth G. Mueller, a former metalwork teacher at Edison Junior High School, is now assistant principal of that school.

Orville L. Ware, teacher of woodwork at

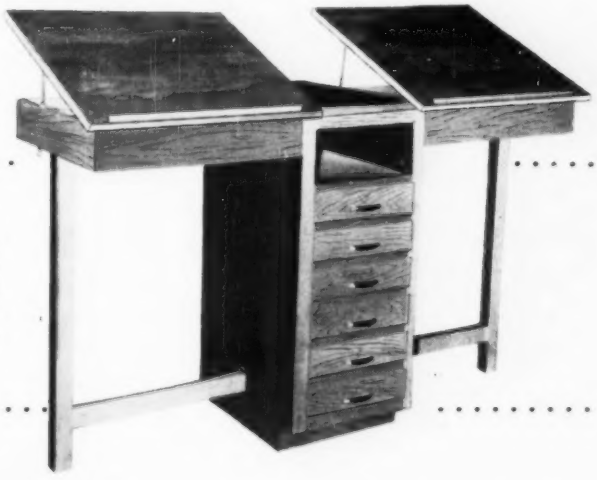
(Continued on page 16A)

B-G SELF-CONTAINED MULTI-STUDENT DRAWING TABLES

SAVE SPACE and COST LESS PER DRAFTING STATION

Price of table ÷ by number of stations = cost per student

MODEL SA-20: TWO-STUDENT DRAWING TABLE
Modern, space-saving, efficient. Center section contains 1 drawer, and 1 roomy cabinet which can be used for drawing boards and plates. Each individual tilting top of ¾" Birch plywood and banded edges, are 24" x 24". Overall size of unit is 60" wide x 24" deep x 36" high. Price **$125.00**



MODEL SA-21: THE NEW DRAWING TABLE
Features 2 adjustable tops, stationary center top, open bookshelf, and 6 drawers with master-keyed locks. Sturdily constructed of Maple and Birch plywood throughout. Each tilting top is of Birch plywood with banded edges, size 24" x 24". Overall size 60" wide x 24" deep x 36" high at front. Price **$145.00**

MODEL WD-44: FOUR-STUDENT DRAWING TABLE
Tremendous space saver. Each hinged drawing board (25" x 21") with pencil ledge, can be elevated to proper angle and held in position with simple hinged wood holders which fold down into compartment beneath board when board is not in use. Same compartment also stores instruments, tools and paper. Overall size 84" x 48" x 30" high. Top of ¾" Birch plywood; base of oak. 5" wide panel under top; 2¼" square legs. Price **$135.00**

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You get Simonds Guaranteed Quality, the buy-word in saws for more than 100 years, at no more than you would pay for regular saws . . . see price list. And Simonds Si-Clone line includes 13 types up to 12" diameter. So get the Si-Clones you need *today* at your local hardware or woodworking machinery dealer.

GUARANTEE: Made of SIMONDS STEEL fully guaranteed against any defect in material or workmanship.

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10"	$4.10
12"	4.60
	6.60

Supplied with Round or Special Shape Holes
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FITCHBURG, MASS.

Factory branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon
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PERSONAL NEWS

(Continued from page 14A)

the Sam Houston Senior High School, was made the assistant principal at Deady Junior High School.

KIENZLE IN NEW POSITION

George J. Kienzle, vice-president of Borden's Mid-West Division, was appointed director of Ohio State University's School of Journalism and professor of journalism. The appointment is effective January 1, 1958. He will succeed Professor James E. Pollard, head of the school since 1938, who last winter asked to be relieved of administrative duties.

In addition to continuing as a professor in the School of Journalism, Professor Pollard has consented to assume the leadership in developing the historical records of the university.

Mr. Kienzle is a graduate of Ohio State University, receiving his bachelor of arts degree with a major in philosophy and emphasis on English. He also had a year and a half of study in philosophy and theology at Princeton Theological Seminary.

His appointment was recommended unanimously by faculty committees in both the School of Journalism and College of Arts and Sciences, as well as the alumni advisory committee of the latter college.

He entered the field of public relations 13 years ago, and has been with the Borden Company as assistant director of public relations, and later as director and vice-president of that division.

WILCOXON RECEIVES APPOINTMENT

Appointment of John M. Wilcoxon, former state director of finance to the position of administrative assistant in the office of business and finance at Ohio State University, was approved by the university's Board of Trustees.

Mr. Wilcoxon assumed his new duties at the University on December 1, 1957. The position is a part of the reorganization of the office of business and finance at the university.

Employed by the state of Ohio since 1924, Mr. Wilcoxon during the 1940–48 period served as state superintendent of the budget and assistant finance director, president of the Sundry Claims Board and Secretary of the State Controlling and Emergency Boards.

He joined the business office staff of the university in 1948, with assignments that included working with the University Health Center and the University's Stores and Receiving Department. In 1953 he became deputy auditor of state, and in 1955 was promoted to State Director of Finance, serving until this year.

A member of the Ohio State Bar Association, Mr. Wilcoxon attended Spencerian College, Akron Law School, William McKinley Law School, and Toledo University.

GEORGE WILLIAM DOAK DIES

George W. Doak, who served the profession of vocational agriculture in Illinois for more than 30 years, died suddenly on September 27, 1957. For the past ten years he had been on the supervisory staff of the Illinois Board of Vocational Education.

His life was devoted toward improving Illinois agriculture, and he was widely known and highly respected by teachers, students, and friends.

Mr. Doak started teaching in Minnesota upon being graduated from the University of

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Now, Wilton Tool Mfg. Co., Inc., offers you a logical method for selecting machinists' vises. New, free specification sheets on Wilton vises enable you to compare Wilton Machinists' Vises with the make you're now buying, feature by feature. They'll enable you to see for yourself that Wilton Machinists' Vises are unsurpassed in design, construction and performance, even though they cost no more than ordinary vises!

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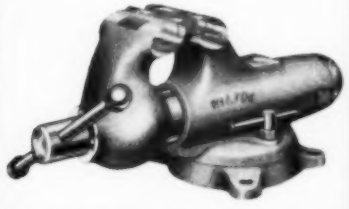
- ★ unconditionally guaranteed for five years!

WRITE FOR WILTON'S MACHINISTS' VISE AND WOODWORKERS' VISE SPECIFICATION SHEET TODAY!



WILTON
TOOL MFG. CO., INC.
Schiller Park, Illinois

Illinois in 1923 and in 1939 received his master's degree from the same school. After three years he returned to Illinois where he taught at Washburn and Metamora high schools for 20 years. Since 1947 he had been a state supervisor of agricultural education.

Those who survive his passing are his wife, a son, and a daughter.

Family and friends of the late George W. Doak have established a scholarship fund to assist worthy and needy students enrolled at the University of Illinois who are preparing to teach vocational agriculture. Contributions to the fund may be sent to the Metamora National Bank or to Mrs. Doak at Metamora. All contributions will be turned over to the University of Illinois Scholarship Committee for distribution.

JOHN C. SPRY PROMOTED

John C. Spry has been promoted from assistant to associate professor of industrial arts at the Ontario College of Education, University of Toronto, Toronto, Ont., Canada.

Professor Spry has attended several industrial arts conventions in the United States, and is a member of the A.C.I.A.T.E. He is president of the Ontario Industrial Arts Association, and a member of both Epsilon Pi Tau and Phi Delta Kappa.

NEW INSTRUCTORS AT OHIO UNIVERSITY

John H. Adams, who taught last year at Oswego State Teachers College, Oswego, N. Y., has joined the staff at Ohio University, Athens, Ohio, to teach bench metalwork. He received both the bachelor's and master's degrees from New Jersey State Teachers College in Newark, N. J.

James J. Armbruster is teaching foundry and electronics at Ohio University, Athens, Ohio. He taught electronics while he was in the armed forces, and last year served as a graduate assistant in the department of industrial arts at Ohio University.

These additions bring the industrial-arts staff at Ohio University to a total of nine men. Three degree programs now offered include the bachelor of education for prospective teachers, the bachelor of science in industrial technology for the preparation of technicians, and graduate courses leading to the master of education.

NEW TEACHERS IN HOUSTON SCHOOLS

Sam McCluney, director of the Houston, Tex., Department of Industrial arts, reports the following new teachers in his department for this year:

Homer Powell is teaching woodwork at Sam Houston Senior High School.

Robert White is a teacher of metalwork at Jackson Junior High School. He taught in Cameron, Tex., last year.

Clark H. Young is teaching metal shop at Lamar Senior High School.

Thomas W. Flannery is teaching crafts at Edison Junior High School.

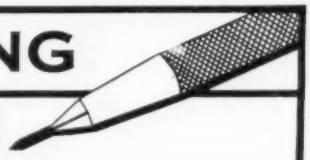
Arthur E. Barborak is teaching metalwork at Burbank Junior High School.

MR. MASSEY AT NORTH CAROLINA STATE COLLEGE

Hal Massey joined the staff as Assistant Professor of Industrial Arts at North Carolina State College, Raleigh, N. C., in September, 1957. He was formerly at the University of Florida, in addition to which he taught in the Florida public schools. He was in the Armed Services for a period of three years serving in the Corps of Army Engineers. He also served in the U. S. Naval Shipyards for a period of four years.

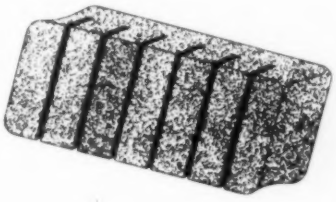
(Continued on next page)

DRAFTING TIPS



"Do it yourself" pencil cleaner

A block of felt such as an old blackboard eraser with a series of parallel grooves in the face has proved to be very efficient for removing graphite

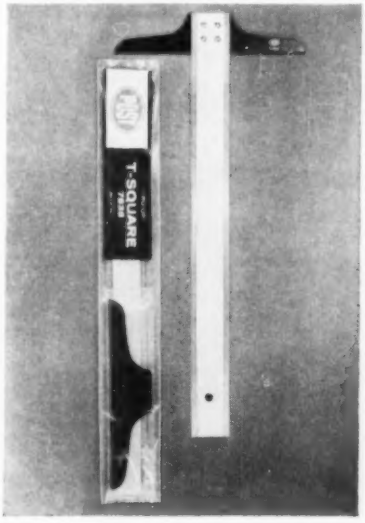


dust from pencil points after sharpening. Pencil point is simply run through one of the grooves after sharpening.

New "TRU-UP" T-SQUARE Eliminates Alignment Problems

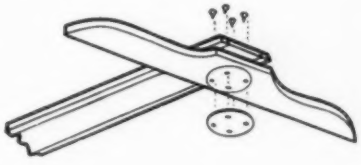
Many of our friends who are industrial arts teachers are particularly enthusiastic in their reception of the latest addition to POST's complete selection of T-Squares.

The new entrant called the "Tru-Up" is basically a high quality 24" maple T-Square Blade with transparent edges. Complete with ebonized head, and key-end construction, it includes the fine finish and precise, quality construction that users have come to expect on any item bearing the "POST" mark.



But, unlike other T-Squares the Tru-Up comes with the head dismounted, in a compact rectangular package about 24½" long. The special patented construction, illustrated in the diagram below, permits the square to be quickly assembled by simply tightening four brass screws.

The handling advantages are obvious. T-Squares become easy to store or to carry to and from class. For both instructor and student the new Tru-Up produces an extra bonus of convenience.



But, even more important, Tru-Up special construction provides protection against rough handling, or even horseplay. If it is knocked out of alignment through abuse, Tru-Up can be readjusted and tightened to perfect squareness.

Tru-Up No. 7838 is so new it is not covered in your existing POST catalog. For complete information on this convenient new drafting tool *write to Educational Sales Division, Frederick Post Company, 3648 North Avondale Ave., Chicago 18, Illinois.*

POST

SENSITIZED PAPERS & CLOTHS • TRACING & DRAWING MEDIUMS • DRAWING INSTRUMENTS & SLIDE RULES
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PERSONAL NEWS

(Continued from previous page)

Mr. Massey received his B.S., and M.Ed., degrees from the University of Florida, and has done work on his doctorate. He is a member of Kappa Delta Pi, Phi Kappa Phi, and Phi Delta Kappa.

RALPH M. KELLELEA DIES

Ralph M. Kellelea, 66, a teacher in industrial arts at the Warren Harding High School, Bridgeport, Conn., died while attending the convention of the New England Industrial Arts Teachers Association at Burlington, Vt., on November 1, 1957.

Mr. Kellelea was secretary of the association for three years. He was stricken about 7:15 a.m., while attending services at the Cathedral of the Immaculate Conception. He was taken to the DeGoesbriand Memorial Hospital, but he died before reaching the hospital.

Mr. Kellelea, whose home is at Stratford, Conn., was soon to retire. He was accompanied to the convention by Edward Stach of Bridgeport, a teacher, and by Frederick Martin, a retired Bridgeport teacher.

He is survived by his wife and daughter.

♦ Darwin Breads, Angola, N. Y., died suddenly while on an extended trip in July, 1957.

Mr. Breads taught for many years at the Bershire School, and in recent years at Silver Creek, and had served for 15 years as Summer Camp Director at the State University Teachers College at Oswego, N. Y.

He was awarded his B.S. in Vocational-Industrial Education in 1952 and his M.S. in Vocational-Industrial Education in 1954, both at Oswego. He had studied also at Albany State Teachers College.

Mr. Breads is survived by his wife, and children.

♦ G. Harold Silvius, Department of Industrial Education, Wayne University, Detroit, Mich., addressed the industrial education teachers of the Upper Peninsula at Marquette, Mich., on October 4, 1957, on "People and Events in the Industrial Arts Awards Program."

On October 19, he delivered the principal address at an Iowa conference of industrial-arts teachers held at Iowa State Teachers College at Cedar Falls, on "The Meaning of Industrial Arts."

♦ John M. Fontana has been appointed chairman of the International Printing Education Week Committee by the International Graphic Arts Education Association.

The theme for this year's celebration during January 12 to 18, 1958, is "Benjamin Franklin — Man of Peace."

from the desk of **MR. SELLEM YAMCO**

Dear Prospect:

Honest-Injun, I still can't figure out how I did this . . . . but it surely illustrates the versatility of the new Yates-American Shaper with its 3" vertical adjustment and lubricated-for-life bearings. May I show you how the Shaper will work for you?

Sincerely,

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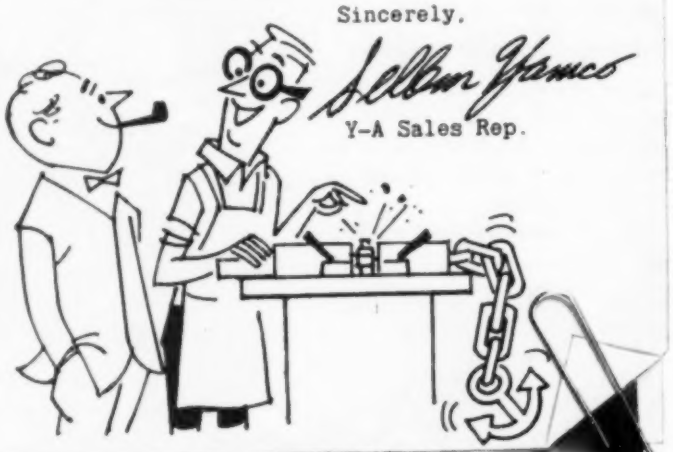
Y-A Sales Rep.



NEW YATES-AMERICAN SPINDLE SHAPER

No more end-play. Rugged spindle unit, positioned by two 1-3/8" bearings, moves on dovetailed ways — permits heavier, chatter-free cuts. Over 850" table surface. Spindle travel: 3-5/16"; speed: 10,000 RPM. Interchangeable, individually adjustable fences. Three reversible throat plates permit fine contour work. Motor sizes: 1, 1-1/2, and 2 HP. Shaper, less motor and controls: $299.

YATES-AMERICAN

Dept. A, 721 Fourth St., Beloit, Wisconsin

News Notes

PRODUCTIVE MAINTENANCE CLINIC

Another Clinic was held at Fairmont State College, Fairmont, W. Va., in November, for all industrial-arts teachers in the northern section of the state.

The fine points on the jointer, table, and band saw were given by representatives from Meisel Machinery Company, Huntington, W. Va., and Rockwell Manufacturing Company, Pittsburgh, Pa.

In addition to the fine points on machines, a demonstration on buffing, coloring, and polishing of metal was given.

This event was the second of a similar type since the one held at Charleston in the spring for teachers in the southern part of the state.

These clinics are sponsored by the two companies, the college, and the State Vocational Department.

EUROPEAN TRAVEL STUDY PROGRAM

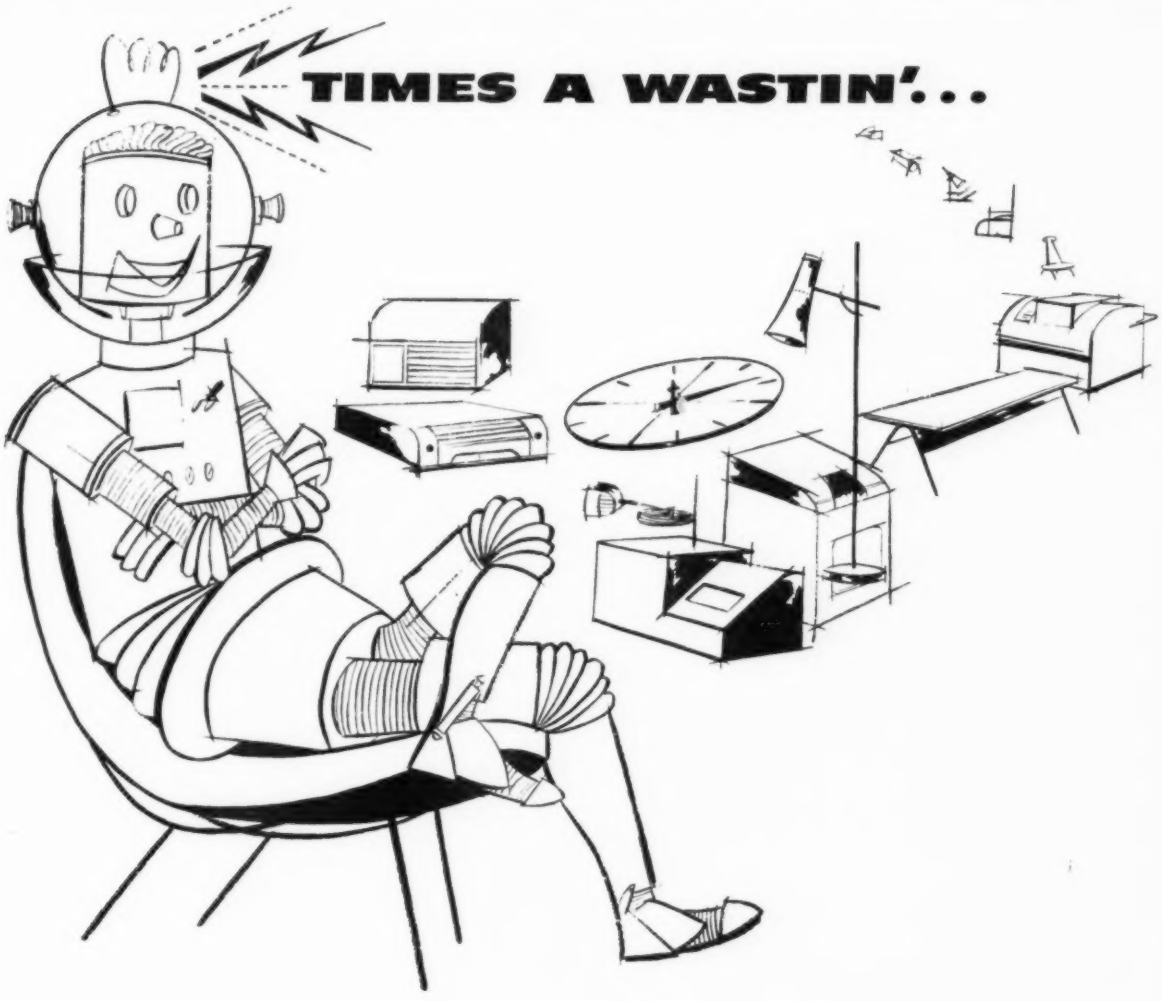
Wayne State University's College of Education and Graduate School again approve credit arrangements in connection with the Eleventh Annual European Travel Study Program in Comparative Education. Personally directed by Dr. Wm. Reitz, professor of education, the group will leave Detroit on June 18 and return on August 28, 1958.

Visiting 12 countries during the 72-day journey, this program is designed to provide teachers, students, and other professional people with an opportunity to survey selected high lights of the life and culture of Western Europe. There are almost 300 alumni of the past 10 programs.

Persons may qualify to earn up to 8 hours of undergraduate or graduate credit to apply on degree programs, for teaching certification, for annual salary increments. Others may audit the program for purposes of personal enrichment.

The high light of the 1958 program will be a two-week visit to Greece, including a five-day boat cruise among the Isles of the Aegean Sea — Crete, Rhodes, Kos, Patmos, Delos, and Mykonos; a five-day bus journey to the classical and archaeological sites of the Peloponnesus; Eleusis, Mycenae, Epi-

(Continued on page 20A)



Get those talented students enrolled in FORD iaa right now!

Your students benefit . . . and you benefit through Ford's nationwide Industrial Arts Awards Program.

IAA gives national recognition to students and teachers for achievement in industrial arts. It helps establish local exhibits for local projects . . . offers students a chance to compete for cash prizes on a nationwide basis . . . and for the 32 outstanding award winners *and* their teachers, IAA provides an event-packed, all-expense trip to Detroit.

Virtually any high quality industrial arts or vocational industrial project by students in the 7th through 12th grades can be entered. Send the attached coupon for entry blanks. But do it today . . . entries must be received in Salt Lake City by June 10, or in Dearborn by June 25, 1958.

FORD INDUSTRIAL ARTS AWARDS, Dept. B

FORD MOTOR CO., The American Road, Dearborn, Mich.

I would like the official IAA rules booklet and entry blanks.
Please send to:

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A QUIZ

DO YOU KNOW THE ANSWERS TO THESE FOUR QUESTIONS?

1. What American Tech book is being used all over the country because of its amazingly effective way of presenting basic electricity and electronics?

2. What popular new textbook teaches basic electricity and electronics through the use of more than fifty related shop projects?

3. What text presents basic electricity and electronics as a single, unified course of instruction?

4. Where can an on-approval copy be obtained?

Answers!

1. Electricity and Electronics—Basic (Steinberg-Ford)

2. Electricity and Electronics—Basic (256 pages. 406 illus.)

3. Electricity and Electronics—Basic (List price: $4.50)

4. Mail coupon below

AMERICAN TECHNICAL SOCIETY
Dept. W311, 848 E. 58th St.
Chicago 37, Ill.

Please send me an on-approval copy of *Electricity and Electronics — Basic*. After as long as thirty days examination I will either return the book or make remittance-less educators' discount.

Name .....

Subject/Position .....

School .....

Address .....

City.....Zone...State.....

NEWS NOTES

(Continued from page 18A)

daurus, Sparta, Olympia, Corinth, and Delphi; climaxed by a full three-day visit to the monuments of the Golden Age of Athens.

Further information may be obtained from *Dr. Wm. Reitz, 727 Student Center, Wayne State University, Detroit 2, Mich.*

FIRST ARTS AND CRAFTS WORKSHOP

Western Michigan University, Kalamazoo, Mich., has conducted its first annual arts and crafts workshop on Saturday, November 9, 1957, which was attended by leaders in the arts and crafts field from the Midwest.

Demonstrations were held in the areas of metal tooling, copper enameling, electric kits for junior high school, leather carving, wood lamination, foundry-non-ferrous metals, silk screen process, and plastics — molding small objects.

At the luncheon meeting of the group, the speaker was Charles G. Riddle, Jr., interior decorator for the Kalamazoo Artcraft Manufacturing Company, Kalamazoo, who discussed "Interior Decorating — Its Application to Industrial Arts."

The program was sponsored by the Department of Industrial Arts at Western Michigan University. Dr. John L. Feirer is head of the department.

GUIDES TO STUDENT PHOTO CONTEST

Entrants in the revised 1958 Kodak High School Photo Contest can benefit materially from two helpful brochures offered by Eastman Kodak Company, sponsor of the contest.

The items, "Contest Cues," containing tips and ideas which have rewarded entrants in years past, and the booklet exhibiting the 16 pictures which earned 1957 top honors are available without charge.

Keyed to the sweeping changes in the new contest, the brochures not only show what kind of pictures the judges thought best, but are full of valuable suggestions on viewpoint and subject arrangement.

"Contest Cues," the booklet containing the 1957 winners, and complete contest details are available from *Kodak High School Photo Contest, Rochester 4, N. Y.*

VALUABLE ADDITIONS TO LIBRARY

Florida State University announced recently its Library has been given more than 400 books, periodicals, and federal and state documents comprising collections of two of the country's pioneers in vocational education.

The materials, all covering vocational education, are from the personal libraries of the late Drs. J. C. Wright and Lindley H. Dennis. Dr. Wright was long assistant U. S. Commissioner of Education in charge of vocational education. Dr. Dennis was a member of the original group which drafted the Smith-Hughes Act and for 17 years was executive secretary of the American Vocational Association.

The books are the gift of Mrs. L. H. Dennis, widow of the educator, and Mrs. Nadia W. Zimmerman, daughter of Dr. Wright. Among the books are rare books and reports documenting the early beginning of vocational education in this country, telling about historical events and the early philosophies of pioneers in this field.

Drs. Wright and Dennis both were known for their leadership and progress in the development of America's program of vocational education.

(Continued on page 25A)

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We feature direct-from-mill-to-school delivery service via truck transports. Your lumber is delivered *where* you want it, *when* you want it — dry, clean and bright.

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CHECK THIS LIST OF READY-TO-SHIP ITEMS

ASH	RED CEDAR
BALSA	RED OAK
BASSWOOD	WALNUT
BEECH	WHITE OAK
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If your school is in a state east of the Mississippi, or in Arkansas, Kansas, Louisiana, Missouri, Oklahoma or Texas—**we can save you money!** See our catalog 57-S for delivered prices. Catalog sent FREE on request, postpaid.

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INSTRUCTORS AND STUDENTS BOTH WIN

1st prize A $100.00 Government Savings Bond for BOTH Instructor and Student

2nd prize A $50.00 Government Savings Bond for BOTH Instructor and Student

3rd prize A $25.00 Government Savings Bond for BOTH Instructor and Student.

FOR THE BEST DESIGNED AND EXECUTED PEPPER MILL AND SALT SHAKER SET, USING "OLDE THOMPSON" HARDWARE

Fun and reward can be yours when you enter the "OLDE THOMPSON" Pepper Mill Contest. Open to all Shop Instructors and their students. A $100.00 Government Savings Bond will be awarded to the student and his (or her) instructor who submits the accepted sample set of pepper mill and salt shaker, constructed around "OLDE THOMPSON" mill and shaker hardware.

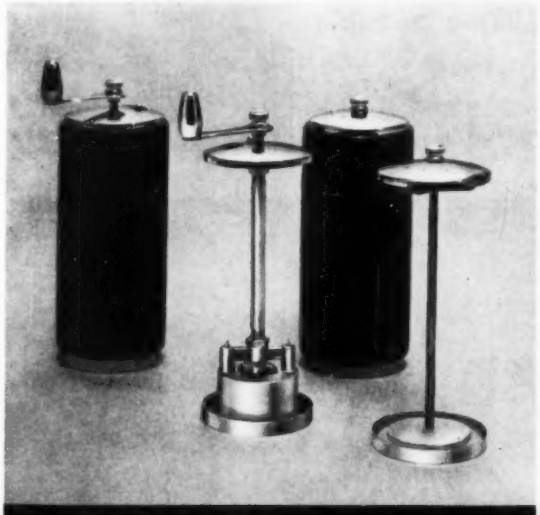
Let this contest be, not only rewarding, but the basis of an interesting shop project. Your students will appreciate the opportunity to compete. Fill out the coupon below, for the "OLDE THOMPSON" project sheet and information on how to obtain the pepper mill and salt shaker hardware. Enter now! Contest closes April 15, 1958. Prizes awarded on, or before, June 15, 1958. All designs submitted become the property of The George S. Thompson Corporation. Preliminary judging will be done from photographs. Final judging from actual samples. *Photographs cannot be returned.*

CONTEST RULES

1. Entries are to be made in the form of photographs or snapshots of the complete set, not to exceed 8" x 10" in size.
2. Photograph must bear name and address of student, name and address of school, and name and address of instructor legibly printed on reverse side.
3. Housing or case for Pepper Mill & Salt Shaker must be student's original design, executed in wood, plastic, leather, pottery, or any other material or combination of materials considered practical by judges.
4. Pepper Mill & Salt Shaker must contain hardware manufactured by The George S. Thompson Corporation as described and illustrated on their Project Sheet #14.
5. Judging will be done by a selected panel of Industrial Art Instructors, Industrial Design Consultants, and an officer of The George S. Thompson Corporation. Decision of the judges shall be final.
6. Judges will consider originality of design, use and practicality of material, and craftsmanship in making their awards.
7. Contest is open to all students and instructors without limitation. Each student and instructor may submit as many photos of finished Pepper Mill & Salt Shaker Sets as they wish.

Preliminary judging will be made from photographs. Finalists will be requested to submit actual Mill & Shaker for final judging. **(Please do not submit actual mill & shaker until requested to do so).**

Olde Thompson®



MAIL THE COUPON FOR "OLDE THOMPSON" PROJECT SHEET AND INFORMATION ON OBTAINING "OLDE THOMPSON" PEPPER MILL & SALT SHAKER HARDWARE.

THE GEORGE S. THOMPSON CORPORATION
509 Mission St., So. Pasadena, Calif. Dept. E

Gentlemen:

Please forward project sheet and complete information on how to obtain "OLDE THOMPSON" Pepper Mill & Salt Shaker Hardware.

Instructor_____

School_____

Address_____

City_____ Zone____ State_____

Association News

COMING CONVENTIONS

Jan. 25. Utah Vocational Association, at Central Utah Vocational School, Provo, Utah. Secretary, Earl S. Lunt, 7076 South 600 West, Bountiful, Utah.

Feb. 22–25. American Educational Research Association, at St. Louis, Mo. Secretary, Dr. Frank W. Hubbard, 1201 Sixteenth St., N.W., Washington 6, D. C.

Feb. 27–Mar. 1. Illinois Vocational Association, at Sherman Hotel, Peoria, Ill. Secretary, Orlin D. Trapp, Township High School, Waukegan, Ill.

Mar. 27–29. Ohio Industrial Arts Association, at Neil House Hotel, Columbus, Ohio. Secretary, C. R. Hawes, Greenville, Ohio.

INDUSTRIAL ARTS CONFERENCE MEETS

The 44th annual meeting of the Industrial Arts Conference of the Mississippi Valley was held on November 7, 8, and 9, 1957. The meetings were held at Hotel LaSalle, Chicago, Ill.

The meeting on Thursday morning, November 7, was opened at 9:30 a.m. by the general chairman, Verne C. Fryklund.

The question to be discussed was "Many graduates of teacher education programs enter industry; therefore, should objectives of industrial-arts teacher education be broadened to include consideration of industrial employment?"

The committee appointed to present the subject consisted of Nelson Hauer, chairman; L. L. Gore; and Lawrence Sechrest.

Teacher education students frequently enter the ranks of technical workers because in their teacher training institution they have acquired some of the skills that fit them into shops where technical work is carried on. The problem, however, is not to de-emphasize the teacher education work.

At the Thursday two o'clock session, the question was discussed on "Should there be a more objective approach in the teaching of design in industrial-arts teacher education?"

The general chairman on this occasion was F. J. Schmidt, Jr.

Ralph Wenrich was chairman of the panel and he was assisted by Robert A. Hardin and Welcome Wright.

A definition of *Design* written by John Jarvis states:

"Designing is simply the conscious and intentional use of materials, tools, and processes to create an object which is not only fit for its purpose, but satisfies the demands of tradition."

Another definition is: "Design is creative planning to fulfill a need."

Structure must be understood if the student is to learn design. The students ought to be taught how to choose good design.

The general chairman of the Friday morning session was L. W. Prakken. The subject matter to be discussed was "History and Development of the Industrial Arts Conference."

The chairman of the discussion panel was John J. Metz, and he was to be assisted by Arthur Mays and Tom Diamond. Unfortunately, the latter had been delayed on his return from Europe and did not arrive in time for the conference.

"The History of the Conference" was presented by that excellent historian, Arthur B. Mays, and "Some of the Problems Discussed at the Earlier Meetings of the Conference" were then presented by John J. Metz, who also made a few remarks about our earlier members.

On Friday afternoon the question "What does the school administrator need to know about industrial arts in order to be better able to supervise intelligently the work of his industrial-arts teachers" was taken up.

Verne C. Fryklund took the place of N. B. Grinstead as general chairman, Grinstead being absent.

The chairman of the panel was C. R. Kinison. His assistants were Nelson Grote and Floyd Krubeck.

Mr. Kinison presented a check list for use by the administrator in the supervision of industrial arts. The items in this list are based on aims and objectives and on organization. This was prepared by Mr. Grote.

Nelson Grote also has constructed an instrument to help in a program of evaluating industrial arts.

Floyd Krubeck stated that industrial-arts teachers have the duty of informing the administrators of their schools about the philosophy and objectives of industrial arts.

On Saturday morning Verne C. Fryklund was the general chairman.

The panel consisted of Beryl Cunningham,

(Continued on page 24A)

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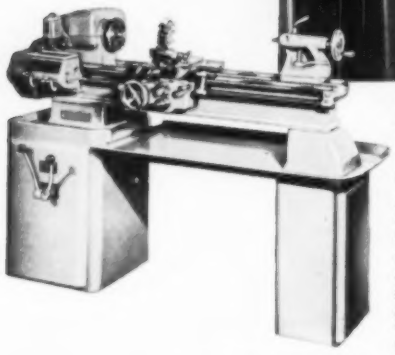

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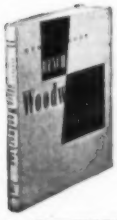

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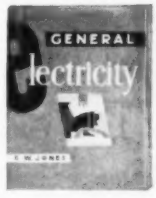

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ASSOCIATION NEWS

(Continued from page 22A)

chairman, and B. C. Tinnell and Coleman Hewitt.

The discussion was on the problems encountered in "Bridging the Gap Between Theories and Actual Practices in Industrial-Arts Education."

Industrial-arts courses must be more than shopwork, and the course should produce behavior changes in the student.

Teacher organizations should help teachers. Seminars, roundtables, etc., are good.

Good shop organization should teach leadership, not only how to get a job done.

At the business session the following men were admitted to membership: Dr. Edward Towers, Ohio State University, Columbus, Ohio; Dr. Harry Gunderson, Northern State Teachers College, Aberdeen, S. Dak.; Dr. Ralph O. Gallington, Southern Illinois University, Carbondale, Ill.; and Dr. Walter Nalbeck, Western Kentucky State College, Bowling Green, Ky.

The 45th annual meeting of the conference will be held on November 13, 14, and 15, 1958, at Hotel LaSalle, Chicago, Ill.

KENTUCKY INDUSTRIAL EDUCATION ASSOCIATION

The Kentucky Industrial Education Association held its First Annual Conference on Friday and Saturday, November 1 and 2, 1957, at the Kentucky Hotel in Louisville.

The Association, representing Industrial Arts, Vocational and Industrial, and Distributive Education teachers registered approximately 350 members for the two-day session.

Topics discussed at the sectional meetings were: "Student Selection and Training of Technicians," "The Place of Crafts in the Industrial Arts Program," "Wood Working in a Modern Industrial Arts Curriculum," "Product Knowledge," "Shop Safety," "Practices and Techniques in the Teaching of Drafting," "Occupational Counseling for Industrial Education Students," "Problems and Practices in Teaching the General Shop," and "Problems and Implications for Industrial Arts in Light of Twentieth Century Developments."

Dr. Robert R. Martin, state superintendent of public instruction, welcomed the group at the first general session, followed by Charles R. Crakes, De Vry Technical Institute, Chicago, who spoke on "Trends and Occupational Opportunities for American Youth."

On Saturday, James L. Patton, state director of vocational education, served as banquet speaker, and his subject was "The Challenge of Industrial Education."

Alumni breakfasts were held Saturday morning representing the following institutions: Morehead State College, Murray State College, Kentucky State College, Western Kentucky State College, Eastern Kentucky State College, University of Kentucky, Stout State College, Tuskegee Institute, Hampton Institute, and University of Louisville.

New officers for the coming year are: Ray Lawrence, president; L. C. McDowell, vice-president of trade and industrial education; G. T. Lilly, vice-president of industrial arts; Charles E. Chattin, and Van Catlett, directors.

Did you know that shellac is used as a bonding agent in the manufacture of certain grinding wheels? It is one of the many industrial applications of shellac. — *Shellac Information Bureau.*

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Contains the right amount of material for the beginner student, or to experiment with yourself. Let's you see how easy it is to repair boats, toys, lamps, furniture, etc. Complete Kit..... $3.95 (plus 50c postage.)

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Makes perfect decorations for windows and planter boxes. Pours easily and forms a tough, resilient, rubbery material when exposed to oven heat of from 300 to 325 deg. F. It's fireproof, washable, fade-resistant, droopless. Can be cleansed with a damp cloth. Available in white opaque, clear, light or dark green, red, yellow and blue. Comes in 8 oz., pint, quart and gallon sizes. Ideal for making an endless variety of toys and novelties, too!

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NEWS NOTES

(Continued from page 20A)

INDUSTRIAL ARTS IN ONTARIO

The province of Ontario in Canada is divided into several zones, the teachers in each zone gathering several times each year to improve techniques and teaching methods.

Ontario universities have not as yet established degree courses in industrial arts. However, a strong committee has been working earnestly toward this goal, and it appears that their recommendation may soon be accepted.

Plans are well under way for the international Industrial Arts convention to be held in Toronto in 1960.

New Publications

Automation in Practice

By S. E. Rusinoff. Cloth, 261 pp., 5⅝ by 8½ in., illus., $6.50. American Technical Society, Chicago, Ill.

This interesting and informative book discusses automation techniques as they are applied in the manufacturing and metalworking industries. Since the subject is treated in terms of processes, rather than of particular industries or products, it is valuable as a general introduction to the entire field.

The 14 chapters present the material under the following headings: automatic controls; pneumatic control devices; hydraulic control devices; electric and electronic control devices; automation in materials handling, and assembling; automation in production of metals; in metal casting processes; in mechanical working of metals; in pressworking of metals; in metal cutting operations; in heat-treating of metals; in metal joining operations; and in inspection and quality control.

Handbook of Layout and Dimensioning for Production

By H. H. Katz. Cloth, 479 pp., 6¼ by 9½ in., illus., $15. The Macmillan Co., New York, N. Y.

This handbook will be found very helpful by students, apprentices, junior and senior draftsmen, detailers, and designers. It presents practical dimensioning requirements over and above those contained in most drafting texts, and shows what industry has developed for use in their drafting departments for the mass production of its products.

The book is valuable not only to the beginner but also to the skilled draftsman and designer.

The author has divided the material in his book into layout practices, technical sketching, projective and descriptive geometry, layout applications, introduction to dimensioning, principles and rules of dimensioning, applications of dimensioning, the radius, the circle, the angle, the plane, datums, and elements of gauging.

Cope's Plastics Book

By Dwight Cope and Floyd Dickey. Cloth, 272 pp., 8¾ by 11¼ in., illus., $4.50. The Goodheart-Willcox Co., Inc., Chicago, Ill.

An excellent book for the school and the hobbyist. It contains 90 well-designed prod-

(Continued on next page)

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This remarkably clear book covers the complete story of electricity: historical development; electron theory; static electricity; electrical fundamentals; types and uses of fuses and switches; electrical resistance; Ohm's Law; magnetism; electro-magnetism; work, energy and power; theory, construction and use of transformers; operation and applications of generators and motors (DC and AC); circuits and controls; practical wiring and electrical apparatus. A complete, authoritative, effective textbook. 480 pages; 5½ x 8½"; illustrated. Order *EFC-1*, only.....$5.95

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Order *ED-12*, only.....$5.00

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Widely used comprehensive Training Course. Includes 36-Lesson Section covering basic radio theory, terms, circuits and symbols, components, test instruments, radio transmitting and receiving principles. The 13-Project Section demonstrates theory in action by practical doing; includes construction projects, application of basic laws, soldering practice, demonstration of components and construction. Adopted as standard text by hundreds of schools. Contains 248 pages; 8½ x 11"; fully illustrated.
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BASIC TELEVISION MANUAL

Invaluable training course for TV instruction. 24-Lesson Section covers oscilloscope principles and application; power supplies; FM carrier waves, discriminators, ratio detectors; antenna principles and design; TV receivers; RF amplifiers and tuners; Video IF, detector, AGC and sweep circuits; cathode ray picture tubes, etc. Project Section includes nine basic projects translating theory into actual practice and so designed as to sustain interest. This effective TV manual contains 280 pages; 7½ x 11"; fully illustrated.
Order *ED-21*, only.....$5.00

COLOR TV TRAINING MANUAL

For advanced students. Covers principles of the Color TV system, including colorimetry, make-up of the color signal; Color receiver circuits (chapters on every type of circuit used in the receiver); Color receiver servicing, including setting up the Color picture tube, alignment, trouble-shooting, test equipment required; also valuable appendices containing equations, vectors, color blocks and colorplates. A comprehensive Color TV training course. 260 pages; 8½ x 11"; profusely illustrated. Order *TVC-1*, only **$6.95**

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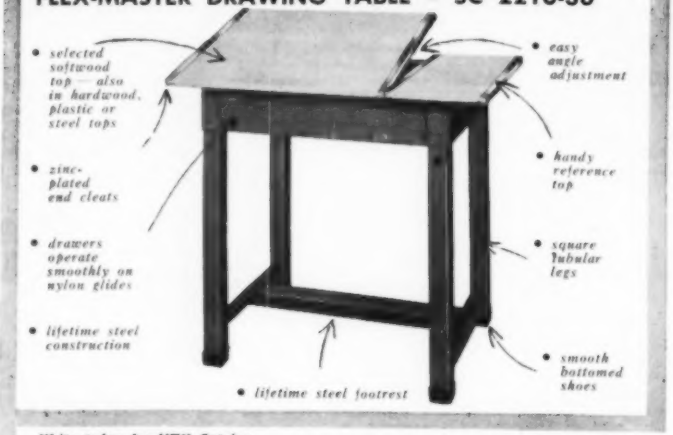
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NEW PUBLICATIONS

(Continued from previous page)

ucts all of them well explained and illustrated.

The book, besides showing the fine number of products, contains chapters presenting facts about plastics, types of plastics in common use, directions for working with acrylics, descriptions on how to do internal carving and coloring of acrylics, polyester resins, and reinforced laminates, and commercial applications of plastics.

RCA Victor Television Servicing Information

Paper, 95 pp., 8¼ by 10¾ in., illus., $1.50. Supreme Publications, Chicago, Ill.

This useful service manual gives the servicing information for the 1957–58 RCA television sets. It also provides information for installation, checking for proper operations such as centering, width, deflection yoke, and height and vertical adjustments.

The index covers the 1957–58 RCA Victor TV sets in numerical order with page reference to the first page on which the given material begins.

The Jewelry Repair Manual

By R. Allen Hardy and John J. Bowman. Cloth, 160 pp., 6⅝ by 9⅝ in., illus., $4.85. D. Van Nostrand Co., Inc., New York, N. Y.

A fine book for the student or the hobbyist. Starting at the beginning the book explains how to make the jeweler's bench and choose the beginner's tools. Then the processes of sawing and filing; buffing and polishing; ring sizing; joint, catch, and pinstem work; chain and link repair; hingework; general repair; making useful tools; stone setting; repairing mountings; are carefully explained. The book also contains a chapter on formulas for various cleaning and oxidizing solutions.

Business and Personal News

BLACK & DECKER AT THE PLANT MAINTENANCE SHOW

The Black & Decker Manufacturing Company will feature and demonstrate two new Magnetic Drill Presses at the 9th National Plant Maintenance and Engineering Show to be held January 27 to 30, 1958, at the International Ampitheatre, Chicago. Other new products to be demonstrated include shears, a nibbler, and impact wrenches. Black & Decker heavy-duty drills, screw drivers, and hammers will also be shown.

Black & Decker will occupy booths 949 and 951 in the Ampitheatre. Personnel manning the booth will include Arthur S. Boehm, sales manager, Industrial-Automotive Division; Edward J. Bernau, central regional sales manager; Harry L. Bullock, Chicago Industrial-Automotive Division sales manager; and Black & Decker sales representatives from Chicago, Indianapolis, Detroit, Cleveland, and Cincinnati.

BROWN & SHARPE TO MARKET LIPE AML BAR FEED

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(Continued on page 28A)

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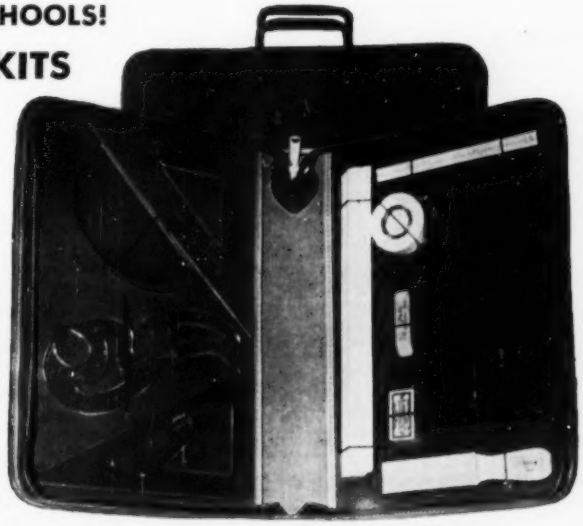

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8" Triangle (45°-90°)	2 Drawing Pencils
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All in attractive, durable, 12" x 16" 3-way zipper carrying case of scuff-proof, waterproof Texon with slide-in handles. Inner compartments for papers. Opens to 16" x 24".

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Choice of Drawing Sets . . . *PLUS*

Protractor	French Curve
12" Triangular Scale	Pencil Pointer
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In handy 10" x 14" zipper carrying case of Texon. Two inner compartments for note papers. Opens to 14" x 20".

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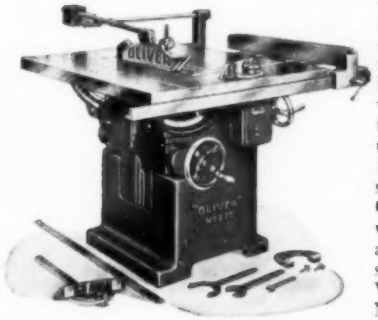
The popular medium-size No. 270 is found in many school shops



This industry-proven Oliver Saw Bench rips, cross cuts, dadoes, miters accurately. Saw arbor tilts up to 45°. Gauges and table are graduated to cut a perfect miter, cut off to length or rip to width without delays for checking measurements. Rips to 16" wide to left of saw, 29" to right. Cross cuts up to 16" wide, 3" thick. Get all the facts on this sturdy Saw Bench. Write for Bulletin No. 270.

OTHER OLIVER MACHINES FOR SCHOOL SHOPS . . .

Band Saws	Mortisers	Speed Lathes
Borers	Surfacers	Metal Spinning Lathes
Saw Benches	Sanders	Wood Trimmers
Jig Saw	Shapers	Vises
Jointers	Tool Grinders	

OLIVER MACHINERY COMPANY
Grand Rapids 2, Michigan

Perfect for the school shop

RUGGED! ECONOMICAL!

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Queen City's new ¾ H.P. Bench or Pedestal combination Grinder and Buffer fits all school shop requirements perfectly. Find out why Queen City Grinders have been used in vocational training for over 30 years. Available from ⅓ H.P. on up.

QUEEN CITY MACHINE TOOL COMPANY
3916 Kellogg Avenue Cincinnati 26, Ohio

Write for FREE Literature

BUSINESS & PERSONAL NEWS

(Continued from page 26A)

Providence, R. I., has announced an agreement with Lipe-Rollway Corporation, Syracuse, N. Y., to sell the latter's Automatic Magazine Loading Bar Feed for installation on Brown & Sharpe Single-Spindle Automatic and Hand Screw Machines. The agreement permits Brown & Sharpe to install, service, and Maintain the Lipe Bar Feed together with the above screw machines anywhere in the United States and Canada.

Both companies will co-ordinate the activities of their engineering personnel to assure quick, efficient, and economical application of all equipment installed under the joint arrangement.

The Lipe AML Bar Feed will also continue to be sold through Lipe's distributors.

A. RALPH COOPER RECEIVES RECOGNITION

A. Ralph Cooper, midwest regional sales manager of The Black & Decker Manufacturing Company, Towson, Md., recently received recognition for completion of 30 years' service with the electric tool company. Black & Decker's traditional orange, black, and gold hexagonal service pin was presented to him by John F. Spaulding, vice-president — general sales manager. The 30-year pin contains six stars, one for each five-year period.

As midwest regional sales manager, Mr. Cooper has a territory under his jurisdiction that includes Minnesota, Iowa, Missouri, Illinois, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Utah, Texas, New Mexico, Colorado, Wyoming, Southeastern Idaho, and Eastern Montana.

LINDE COMPANY SPONSORS CONTEST

A contest for Indiana high school students taking welding courses is being conducted in 1957–58 by Linde Company, Division of Union Carbide Corporation, and the Indiana Industrial Education Association. This is the second year the contest has been held.

Linde will award $300 in cash prizes, and a special prize of a complete oxyacetylene welding and cutting outfit with a retail value of $85 will be given to the student entering the most original welded project.

All entries are to be delivered to and judged at the annual meeting of the Indiana Industrial Education Association, on March 27 through 29, 1958, at the Antlers Hotel, Indianapolis.

Bulletin board rules for the contest have been mailed to all Indiana high schools that offer classes in oxyacetylene welding.

TAYLOR NAMED DFPA FIELD PROMOTION DIRECTOR

Stanley A. Taylor has been named Field Promotion Director of the Douglas Fir Plywood Association, it was announced by W. E. Difford, Managing Director of the association. He steps into the position formerly held by Joseph Weston, retired, who had been with the association since 1938.

The DFPA Field Promotion Department, now with a staff of 34 men in the field, has been in existence for 20 years. Its function is intensive promotion of volume use of fir plywood through personal calls on specifiers and large users in major markets, chiefly in the construction and industrial fields.

Mr. Taylor has been Assistant Field Promotion Director since 1955. He was a field representative for the association from 1952 to 1955, first in the Los Angeles area and subsequently in Tacoma.

NATIONAL WOODWORKING CONTEST

Albert Constantine and Son, Inc., is conducting a national woodworking contest, the purpose of which is to give amateur woodworkers an opportunity to gain national recognition and win one or more of 309 prizes.

Albert Constantine, Jr., who is president of the 145-year-old firm which distributes fine cabinet woods, veneers, and craftwork supplies throughout the country, believes there are many woodworkers who are proud of their skill but never have an opportunity to display it outside the circle of their immediate family and friends. He would like to see them get national credit for their craftsmanship.

The contest is divided into three classifications: (1) articles made with surfaces actually veneered by the contestant; (2) lumber projects made of wood ⅛ in. thick or thicker; and (3) any combination of solid lumber and plywood or lumber and veneers.

Contestants have merely to submit photographs of their work and a brief description to the board of nine judges, on which some of the country's outstanding authorities on woodwork are serving. Entries will be accepted up to March 31, 1958.

Complete information and an entry blank may be obtained by writing to *Constantine's National Woodworking Contest, 2050 Eastchester Road, New York 61, N. Y.*

read how "versatile, "boy-proof" machines add interest to your metalworking area
"It's Easy to Bend", an interesting 36 page book that shows how rods, straps and tubing are formed, tells how a single Di-Acro Bender is tooled for many operations.
The Spartan Model Di-Acro Box and Pan Brake and exactly how it forms many sheet metals into various shapes is fully explained in a 4 page folder.
Cylinders and how to form them in 16 ga. steel on a Spartan Model Di-Acro Roller are covered in the Roller Bulletin.
Fast, accurate cutting of sheet metal, plastics and other materials on the Di-Acro Shear is the subject of a 12 page "Handy Guide".
Advantages of the Di-Acro Notcher in box and pan projects, etc. are told in another 'Handy Guide'.
If you are adding to, or setting up a new shop, you'll also want the latest Di-Acro Specification Sheets.
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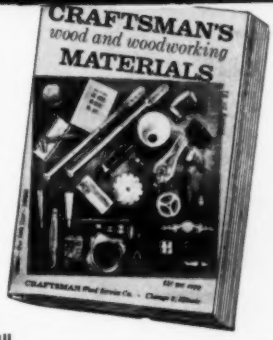

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- Same day shipment; guaranteed

Shop Equipment News

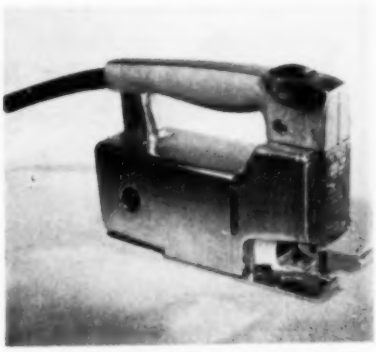
STANLEY HEAVY-DUTY SABRE SAW

Stanley Electric Tools, division of the Stanley Works, have now available their new heavy-duty sabre saw. This entirely new sabre saw is a ruggedly built faster-cutting, portable tool designed for longer service. It can cut through a full 2 inches of lumber and it cuts metal, plastics and veneers, composition board, rubber, and leather.

There are 21 different blades to select from. A single screw secures the blade and holds it rigid. An unusual feature allows the user to cut right up to a wall by simply moving the base back and using the special shear cutting blade. A new anti-vibration mechanism reduces vibration to a minimum and a chip blower keeps the guide line clear.

Cool and comfortable to handle, the H75 sabre saw has three assorted blades included. As a bonus Stanley offers a free ripping guide.

The heavy-duty sabre saw kit (H775) includes the H75 sabre saw, an assortment of eight different blades, a ripping guide and a fitted metal carrying case. Stanley electric tools are sold only by leading distributors.



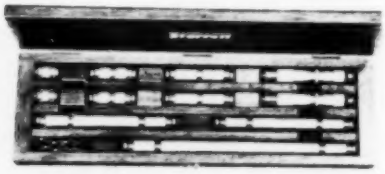
Stanley Heavy-Duty Sabre Saw

(For further details encircle index code 101)

STARRETT NO. 244 SERIES END MEASURING RODS

The L. S. Starrett Company have introduced their new Satin Chrome Precision End Measuring Rods for use with jig borers and other machine tools where spacings and table settings must be held to a high degree of precision.

The No. 244 Series rods are available in 1", 2", 3", 4", 5", 6", 7", 8", 10", 12", and 15-inch sizes (also in Metric), and may be purchased in standard sets or in any combination of sizes to suit specific requirements. Also available are two micrometer heads, each of 4 to 5-inch range, graduated to read in ten thousandths of an inch (or hundredths of a mm.).



New Starrett No. 244 Series End Measuring Rods

The end measuring rods are made of fine tool steel with Satin Chrome Finish. They have precision ground and lapped contact faces and each rod has several concentric collars of 5/8-in. diameter which are ground concentric, parallel and square with the contact faces. These serve as bearing surfaces when the rod is placed in the groove of a machine tool and also facilitate handling.

(For further details encircle index code 102)

HANDY, ACCURATE, INDIVIDUAL RADIUS GAUGES

Brown & Sharpe Manufacturing Company have announced a new series of gauges, providing the easiest and most precise way of checking radii from 1/32 in., to 1/2 in. Each of these No. 628 Radius Gauges has five different gauging edges, permitting testing of both convex and concave radii even when recessed, and making the testing of corner

(Continued on page 32A)

This lamp-making project serves TWO purposes

This lamp-making project teaches students more than just how to make a lamp. . . . It shows them how to make a lamp that is also *an efficient lighting instrument!*

To make a lamp that gives good light, follow this simple rule:

From the average eye-level height of a seated person (40"), subtract the average end table's height (24"). The difference—15"—is about what a lamp should measure from the table to shade bottom.

This and other valuable lamp-making facts are part of the program called "Working with Light." This program—which helps you teach "the facts of light"—was prepared by the Better LIGHT Better SIGHT Bureau after consultation with representatives of the N.E.A. and others prominent in the field of industrial arts and vocational education. Specially designed for high school and junior high school industrial arts classes, this program includes a 116-page Lighting Handbook, 12 Project Leaflets and a student Reference Folder.

FREE AIDS. A complete package of "Working with Light" materials will be sent to shop teachers *without charge* in areas where there is a Better LIGHT Better SIGHT Bureau sponsor. (We will check our sponsor list for your area if you fill in and mail the coupon today.)

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IA-18

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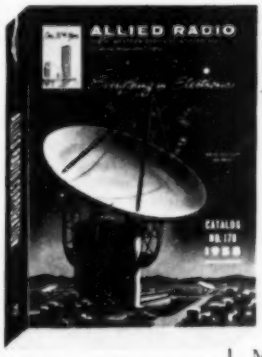
everything in electronics for the SCHOOL



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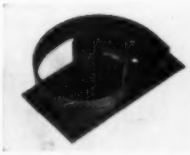

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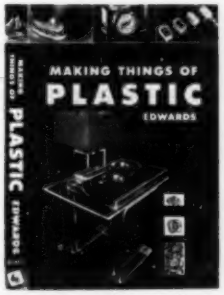
IN THIS ISSUE! author of MAKING THINGS OF PLASTIC

Lauton Edwards *TELLS HOW!*



Lauton Edwards . . . well-known established authority on the teaching of plastics authored the revealing article, "*How we made our own Plastic Forming Press,*" found elsewhere in this magazine. Portions of the factual and authoritative material for the article were excerpts from Mr. Edwards' current book, "MAKING THINGS OF PLASTIC." In this wonderful text, plastic processes are fully described and illustrated. Step-by-step procedures and numerous attractive modern projects for school craftsmen are shown. Includes methods of cutting, molding, selecting material, engraving, coloring, designing and laminating. Everything the young student needs to know about this most exciting craft. Interesting project suggestions and plans include pen stands, picture frames, bookends, finger rings, cuff links, key rings, bracelets, lamp bases and stands, small furniture pieces, and a wide variety of other attractive articles.

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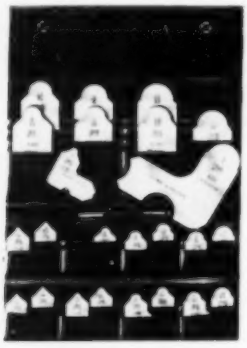
Equipment Division

SHOP EQUIPMENT NEWS

(Continued from page 30A)

radii easy. Gauges are stainless steel, furnished with an interchangeable holder which simplifies their use.



Brown & Sharpe Radius Gauges

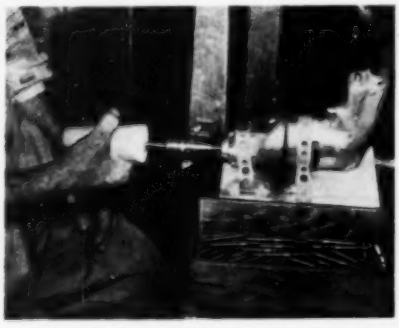
These gauges are available in three desirable sets: $\frac{1}{32}$ in., to $\frac{17}{64}$ in., $\frac{9}{32}$ in., to $\frac{1}{2}$ in., by 32nds, and a combined set of both ranges. Individual sizes are also available singly. Sets come in a handy case with a holder.

Bulletin M 56 completely describes these gauges. Ask for your copy.

(For further details encircle index code 103)

BLACK & DECKER TAPGUN

Insertion of hanger bolts into wooden furniture legs has been speeded up over previous methods with the use of a Black & Decker ¼-in. Tapgun, according to George Nesser, plant superintendent of Artistic Furniture Company, Inc., of Kansas City, Mo. The



Black & Decker Tapgun

speedup feature of the Tapgun is its automatic reversing mechanism.

To adapt the Black & Decker ¼-in. Tapgun, the tapping collet was replaced with a special adaptor containing internal machine threads. The Tapgun is secured in a horizontal position. As an experiment, the operation was timed. Insertion of each hanger bolt in the collet took approximately ½ second, and then the screwing of the opposite end into a precut wooden table leg was a two-second job. Removing the finished piece with the Tapgun's automatic reversing mechanism set in motion when the operator pulls backward, took another second. All together, with a skilled operator, several hundred such legs

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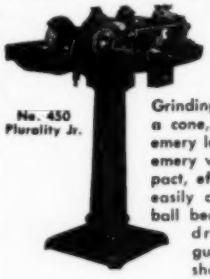

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NOW AVAILABLE IN 3 SIZES
No. 425 Plurality Sub Jr.
No. 450 Plurality Jr.
No. 475 Plurality

Grinding can be done on a cone, coarse or fine or emery leather stropping or emery wheels. Unit is compact, efficient, serviceable, easily accessible and has ball bearing direct motor drive. Especially guarded for school shop use. Details on request.

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This featherweight one-piece goggle fits all faces — men and women alike. Optically perfect and molded to .060" thickness, lenses are impact-resistant and afford protection for light grinding, spot welding, and other semi-hazardous operations. May be worn over prescription glasses. Handsome styling ends complaints about ugly, cumbersome goggles — everyone will want to wear them!

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are fitted with $\frac{3}{16}$ by $2\frac{1}{2}$-in. hanger bolts taking an average time of six seconds apiece.

The Black & Decker Tapgun fitted with a special collet can also be used to insert hanger bolts in overhead beams, walls, and many other places.

(For further details encircle index code 104)

EASTMAN MODIFICATION KIT

A Verifax 9-inch Modification Kit which permits users of the Kodak Verifax Copier, Legal Size, to copy originals up to 9 inches by 14 inches has been announced by Eastman Kodak Company.

The kit is expected to prove particularly valuable in copying forms that extend right out to the margin of the paper. In addition, it facilitates the preparation of offset masters via the Verifax Offset Method.

The kit includes a nine-inch-wide Verifax Copy Paper Tray, Matrix Dispenser, Adapter Guide, and Squeegee.

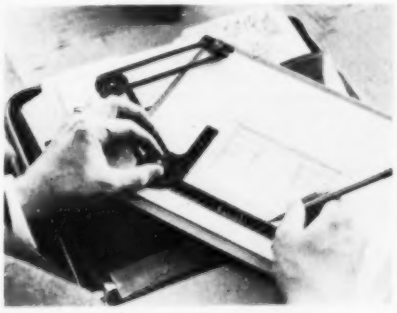
Larger, nine-inch-wide Verifax Matrix and Copy Paper is also available now for use with the Verifax Copier, Legal Size, and the 9-in. modification kit.

The Verifax 9-in. Modification Kit is available from Kodak Verifax dealers. Write for further information.

(For further details encircle index code 105)

A NEW-DESIGN PORTABLE DRAFTING MACHINE

David Miller & Associates have introduced a new-design portable drafting machine, so compact that it can be folded jackknife-style to fit in the pocket when detached from its drawing board, for use in the office, home, classroom, workshop, and in the field.



Draftette — the Portable Drafting Machine

Called "Draftette," the precision instrument, in its new design, is now available attached to a portable drawing board that fits easily into a briefcase. The unit takes the place of T square, ruler, protractor, and triangles. It is suggested for use wherever drawing, drafting, sketching, and designing with high accuracy is required.

Draftette is of all aluminum construction, anodized jet black with gleaming white-filled numbers and letters of the scale and 180-deg. protractor. Use of aluminum accents the lightness, long life, and dimensional stability of the unit.

More information is available.

(For further details encircle index code 106)

COMBINATION LEAD HOLDER AND POCKET POINTER SET

Alvin and Company have made available a 5-in. pocket-size lead holder, Kleen-Point lead pointer, tube of popular refill leads and

(Continued on next page)

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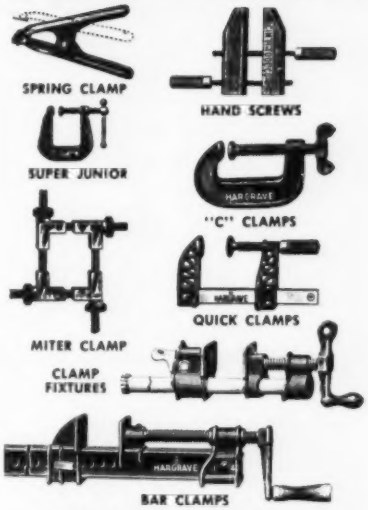

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SHOP EQUIPMENT NEWS

(Continued from previous page)

an extra set of replacement blades — an ideal combination of the basic drawing or writing tools for all professions, technicians, and students.

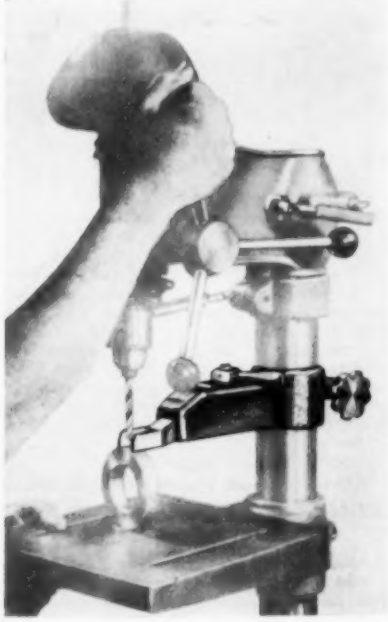
The featherweight mechanical lead holder is 5 in. long with a convenient pocket clip. *Positive-action-clutch* holds lead firmly and will not shear or weaken lead. A press of the button at the top of barrel instantly ejects lead. Upon release, it automatically grips lead firmly and secures it at any desired position. It will hold any standard size drawing lead. Nonrolling, form-fitting knurled shaft permits easy handling. Hard rubber featherweight barrel assures perfect balance and years of service. Knurled nickeled furrows complement the jet black finish and modern design.

The Kleen-Point pocket lead pointer is a convenient, compact pocket pointer with 4 tempered steel blades which assure perfect clean points every time. A graphite cup retains lead particles and is easily removed for cleaning . . . guide tube prevents lead snapping. Made of durable anodized aluminum ¾ in. thick, 2½ in. long with a nonrolling square design, it is ideal for use in the home, office, shop, school or field. Combination set also includes an extra set of replacement blades and a tube of popular refill leads of superior quality and drawing strength.

(For further details encircle index code 107)

CINCINNATI'S NEW DEVICE — STA-PUT

Cincinnati Tool Company have introduced their new product — Sta-Put. It is a convenient and efficient device for drill press operators. The split collar of Sta-Put is easily attached to a drill press column; it can be quickly adjusted to hold almost any Fidelity Tape Recorder. Push-button operated, shaped piece securely in desired alignment



Cincinnati's latest — the Sta-Put

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Sta-Put eliminates slipping, reduces drill breakage, spoilage of expensive material, and the danger of broken fingers and skinned knuckles.

(For further details encircle index code 108)

NEW LINE OF SUPER-CHROME SAW BLADES

Cocker Saw Company celebrates its 100th year of quality saw blade manufacturing by introducing a new line of Super-Chrome Saw Blades for industrial and home hobby users, at no increase in price.

The Super-Chrome Blades outwear ordinary blades three to five time longer. They protect the cutting points of the teeth from normal wear and dulling. Sawdust clears the gleaming gullets quickly and effortlessly to permit the blades to cut fast and clean.

The Oldham line of saw blades is manufactured by Cocker for home hobbyists, and the heavy duty Cocker line is for industrial use.

Sets of three of the Oldham line of Super-Chrome blades are newly packaged in beautifully colored envelopes, and the set includes a combination, a crosscut, and a ripsaw blade of 8-in. diameter.

For further information write to the Cocker Saw Company, Inc.

(For further details encircle index code 109)

WEBER MALFA OIL COLOR

F. Weber Company have announced their new Weber Malfa Gold (metallic bronze)

(Continued on next page)

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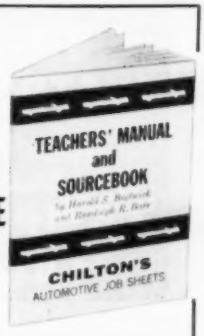

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SHOP EQUIPMENT NEWS

(Continued from previous page)

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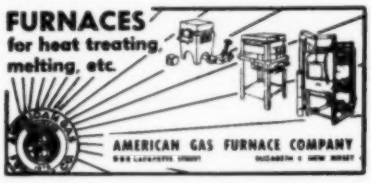

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Code No.		Page No.
10	**Adjustable Clamp Company**..... Jorgensen and pony clamps.	8A
11	**Allied Radio Corp., The**..... Electronic supplies.	31A
12	**American Gas Furnace Co.**..... Heat treating equipment.	36A
13	**American Technical Society**..... Electricity and electronics. Use coupon page 20A for on approval copy.	20A
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15	**Atlas Press Company, The**..... Woodworking project books. Use coupon page 33A enclosing $1.00 for copy.	33A
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17	**Bennett Co., Inc., Chas A.**..... Book on making things of plastic.	31A
18	**Bergen Arts & Crafts**..... Catalog on enameling, jewelry & ceramics.	36A
19	**Berger Scientific Supplies Corp.**..... All-in-one drafting kits.	27A
110	**Better Light Better Sight Bureau**.... Lamp making project. Free aids. Use coupon page 22A.	30A
111	**Black and Decker Mfg. Co.**..... Power built sander-grinder.	7A
112	**Board of Examiners**..... Teaching positions.	36A
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116	**Can-Pro Corporation** ..... Aprons-coats.	34A
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118	**Chilton Company** ..... Automotive job sheets.	35A
119	**Cincinnati Tool Company, The**..... Hargrave tools.	33A
120	**Constantine & Son, Inc., Albert**..... Catalog of woods, tools & materials.	34A
121	**Copper Shop, The**..... Enamel-on-copper ideabook.	36A
122	**Craftsman Wood Service Co.**..... Catalog of wood & woodworking equipment. Free to instructors. Use coupon page 29A.	29A
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124	**Cunningham Co., M. E.**..... Safety wedge grip letters & figures.	11A
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127	**Designers Company** ..... Castings for school projects.	36A
128	**Dietzgen Company, Eugene**.....2nd cover Drafting, surveying & print-making supplies.	
129	**DonJer Products** ..... Free catalog on pre-tested new ideas for school shops.	32A
130	**Driscoll & Co., Martin**..... Inks.	34A
131	**Electric Hotpack Company, Inc.**..... Electric ceramic kilns.	33A
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139	**Giles and Kendall Co.**..... Knockdown cedar chest & aromatic red cedar lumber.	36A
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142	**Hardwood Corp. of America**..... Lumber for school shops.	20A
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INDUSTRIAL ARTS AND VOCATIONAL EDUCATION — January, 1958
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146	**Johnson Gas Appliance Co.** No. 133 forge furnace.	4A
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149	**LeBlond Machine Tool Co., R. K.** Regal lathes.	4th cover
150	**Machine Shop Project Service** Project kits.	36A
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SHOP EQUIPMENT NEWS

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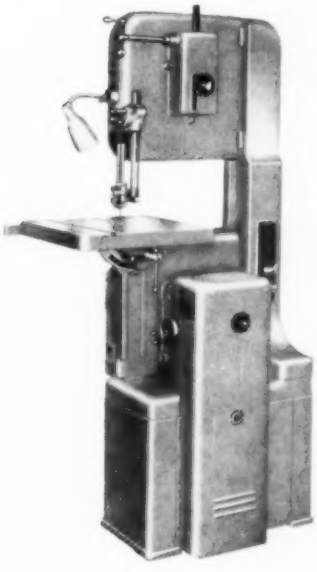

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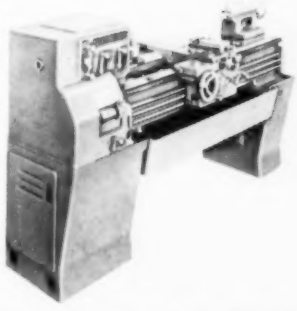

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